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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

ANTISMALARIA CO-ORDINATION IN ASIA  
ACCIDENTAL DEATHS AMONG CHILDREN AND ADOLESCENTS

EPIDEMIOLOGICAL AND STATISTICAL INFORMATION

REPORTS OF EXPERT GROUPS

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WORLD HEALTH ORGANIZATION

PALAIS DES NATIONS

GENEVA

The World Health Organization (WHO) is a specialized agency of the United Nations and represents the culmination of efforts to establish a single intergovernmental health agency. As such, it inherits the functions of antecedent organizations such as the Office International d'Hygiène Publique, the Health Organisation of the League of Nations, and the Health Division of UNRRA.

WHO had its origin in the proposal made at the United Nations Conference held in San Francisco in 1945 that a specialized agency be created to deal with all matters relating to health. In 1946, representatives of 61 governments met at the International Health Conference, New York, drafted and signed the WHO Constitution, and established an Interim Commission to serve until the Constitution could be ratified by 26 Member States of the United Nations. The Constitution came into force on 7 April 1948, the First World Health Assembly met in Geneva in June 1948, and on 1 September 1948 the permanent Organization was established.

The work of the Organization is carried out by three organs: the World Health Assembly, the supreme authority to which all Member States send delegates; the Executive Board, the executive organ of the Health Assembly consisting of 18 persons designated by as many Member States; and a Secretariat under the Director-General.

The scope of WHO's interests and activities exceeds that of any previous international health organization and includes programmes relating to a wide variety of public health questions: malaria, tuberculosis, venereal diseases and treponematoses, and other communicable diseases; maternal and child health; mental health; social and occupational health; nutrition; nursing; environmental sanitation; public health administration; professional education and training; and health education of the public. In addition, WHO undertakes or participates in certain technical work of international significance, such as the compilation of an international pharmacopoeia, the setting-up of biological standards and of standards for insecticides and insecticide-spraying equipment, the control of addiction-producing drugs, the exchange of scientific information, the drawing-up of international sanitary regulations, the revision of the International Lists of diseases and causes of death, the collection and dissemination of epidemiological information, and statistical studies on morbidity and mortality.

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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## SCHEDULE OF MEETINGS

- 7-12 January Standing Committee of the Executive Board on Administration and Finance, Geneva
- 14-20 January WHO Tuberculosis Workers' Conference, New Delhi
- 15-26 January \* Nineteenth session of the Executive Board, Geneva
- 21-26 January Seminar on Application of International Sanitary Regulations, Maracay
- 31 March- Regional Training Course on Rabies, Caracas  
13 April
- 7 May-24 May \* Tenth World Health Assembly, Geneva
- 27-31 May \* Twentieth session of the Executive Board, Geneva

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Territorial dates are tentative

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## ANTIMALARIA CO-ORDINATION IN ASIA

What may prove to be a significant step forward in Asia's fight against malaria was taken in Saigon in November 1956, when the first meeting of the Antimalaria Co-ordination Board was held. Here, for the first time, Government representatives from the Board's five Member States (Burma, Cambodia, Laos, Thailand and Viet Nam) charted out a course which is designed to lead towards closer co-ordination between the participating countries and the establishment of permanent antimalaria services with adequate support to ensure their success.

The Antimalaria Co-ordination Board came into being as a direct result of a recommendation made by the WHO-sponsored Inter-country Malaria Conference which was held in Phnom-Penh in January 1956. The report of the Board's first meeting reveals that Member States have all made positive progress in national antimalaria work, although, as is understandable, the antimalaria services are in different stages of development. The programmes, however in all the participating countries are similar in planning for malaria eradication by nationwide house-spraying campaigns, directed principally against *Anopheles minimus* as their common major vector of malaria. All countries report that the use of DDT applied with compression sprayers, has been generally effective. However in some areas it is proposed that the spraying campaigns will be supplemented by a programme of malaria treatment. Large-scale activities are also planned in technical surveys for guidance and evaluation, technical training and public information.

In Thailand a permanent division of malaria control in the national public health services has been established and the house spraying campaign, begun in 1950, has now reached virtually all malarious areas throughout the country. Similarly Burma has a well-organized antimalaria service and the

campaign there is expected to cover practically all malarious areas in 1957. Cambodia, Laos, and Viet Nam are at present in the early phase of establishing permanent services. The present status of the antimalaria programme is revealed by the following table, taken from the Board's report.

Country	Total population	Population in malarious areas	Population in areas given protection
Burma	18 000 000	8 000 000	6 300 000
Cambodia	4 500 000	800 000	411 000
Laos	3 000 000	2 000 000	
Thailand	20 000 000	11 000 000	10 600 000
Viet Nam	12 100 000	4 500 000	
Total	57 600 000	26 300 000	17 311 000

Newly planned national eradication programmes are just beginning in Laos and Viet Nam.

The detailed results obtained by the various Member States show that considerable progress has been made towards malaria eradication. Burma and Thailand have had excellent results in the reduction of *A. minimus* and malaria in practically all of the areas DDT-sprayed for about three successive years. Cambodia and Viet Nam also report excellent results in the reduction of malaria, following DDT house-spraying campaigns, although, in certain areas, population movements have created special control problems. Laos is now entering upon a newly-revived programme of malaria eradication conditions are generally similar to those in Thailand, with limited areas experiencing some of the problems associated with Cambodia and Viet Nam.

### Planning long-term programmes

Although these results, achieved on a national scale, are eminently satisfactory the report emphasises that malaria eradication, to be effective, requires permanent national antimalaria services with well-

developed plans for an intensive campaign of relatively few years to eliminate the disease, followed by a long term programme to prevent its reappearance. Provision must also be made for adequate staff and budget to implement both phases of any eradication programme. The report refers to difficulties experienced by the five countries in recruiting and retaining antimalaria workers and, also the budgetary problems which are inescapable in such large scale field programmes. However as the Board points out the present time is particularly favourable for nation wide eradication campaigns when assistance from WHO the United Nations, and the United States International Cooperation Administration is available.

Quite apart from the problems relating to the over all management and control of malaria eradication campaigns, there are also certain special difficulties which apply particularly to the five countries concerned.

One of these is the practice of agricultural workers occupying temporary shelters in plantations during the periods of cultivation. In these shelters they are exposed to malaria and it is extremely difficult to locate and spray such temporary dwellings. The structures, also are usually too open for effective sprayed surfaces on which the malaria vector may rest. Another problem is that of transportation, as it is found that in parts of Cambodia the most technically effective period for house spraying unfortunately coincides with the most unfavourable season for field operations, due to weather conditions.

#### *Resistance of malaria vectors to insecticides*

In discussing the question of vector problems, the Board's report supplies some interesting information. None of the participating countries, it is stated found evidence



*Antimalaria measures in Thailand. Searching for larvae in irrigation ditches in the Chienyung Valley*

Spraying the walls of a  
Thai temple



of resistance in any of its actual or potential malaria vector species. However *A. sinuatus* is involved in malaria transmission in coastal areas of all the five countries, with the exception of Laos. This species was shown in certain parts of Indonesia to have a certain resistance to DDT although it remains susceptible to control by dieldrin. *A. leucosphirius* has recently been found infected in two limited forested areas of Thailand. This species has also been incriminated as a malaria carrier in Burma and is considered a possible vector in Cambodia, Laos and Viet Nam. The report stresses that it should be given careful attention in work aimed at malaria eradication in the Member countries.

Since the Phnom-Penh Conference in January 1956, various of the Board's Members have taken steps towards co-ordination of antimalaria work. For example, representatives of Burma and Thailand met at Chengmai in August 1956 in order to co-ordinate antimalaria work along their common frontier. Laos and Thailand are also co-ordinating antimalaria activities, with

Thailand supplying technical training and consultation in the newly-revised Laos malaria eradication project. Cambodia and Viet Nam are also developing plans for further co-ordination work with neighbouring countries.

In connexion with inter-country co-ordination, the Board's report points out that it is essential to develop definite time schedules in the national antimalaria operations which will result in bringing adequate protection to both sides of a frontier simultaneously particularly at crucial traffic points. The Board also noted that it was of considerable interest to know precisely when the entire protection of all malarious areas could be anticipated in neighbouring countries.

At the conclusion of the Antimalaria Co-ordination Board's meeting, various resolutions were adopted, designed to implement and co-ordinate antimalaria work in the five countries. These dealt with, inter alia, the recruitment and training of malaria workers, the establishment of effective malaria reporting systems, the standardization of

procedures and the exchange of information the proposed yearly meetings of the Board and co-ordination with WHO and, finally a resolution extending an invitation to the Government of the Federation of Malaya,

through WHO to become a member of the Board. The next planned meeting of the Board will be in December 1957 in Bangkok at the invitation of the Government of Thailand.

## ACCIDENTAL DEATH AMONG CHILDREN AND ADOLESCENTS

Accidental death is nowadays of increasing concern to public health authorities. Among children and adolescents it often rates as the leading cause of death primarily because preventive medicine has succeeded in lowering the loss of life which previously occurred through infectious and parasitic diseases. This problem of accidental death in the younger age groups has led to a desire for international investigation with the object of devising effective methods of prevention. Until recently comprehensive data on accidents in general were lacking, and when the problem was raised in WHO it was felt that adequate statistical information on accidents as a factor of mortality was the first essential. Accordingly WHO inaugurated a statistical investigation in a number of countries. Information thus compiled has been sifted and analysed by three members of the WHO Secretariat in an article entitled "Accident Mortality Among Children" which appears in the current issue of the *Bulletin*.<sup>1</sup>

With the proviso that statistical information of this type can only serve to give a partial picture of the whole question of accident causation the authors do nevertheless, point to certain trends which emerge from the material examined. It is noteworthy that accident mortality among males is consistently higher than among females, with the exception of the two extremes of life where other factors come into play. Noteworthy also is that between the ages of 15 and 25 the male accident death-rate in Australia, Canada, Sweden, Switzerland and the USA exceeds the female death-rate from all causes, and it

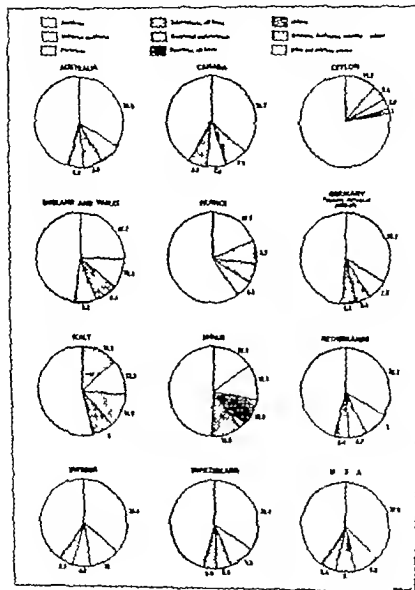
is thought that traffic accidents involving young men provides the explanation.

### Accidents and working life

The economic and social significance of higher accident rates should not be overlooked. When mortality figures are expressed in terms of "working life" lost, accident ranks at the top together with heart disease, cancer and pneumonia. Examples show that in the year 1945 in the United States, working years lost through accidental death were calculated at 1 750 000 as compared with 1 680 000 for heart diseases, 1 100 000 for pneumonia, and 1 040 000 for cancer. Statistics for England and Wales for the year 1954 show that accident moved up to third place on the basis of "working life". Such causes of death as heart disease and cancer which account for more deaths at all ages than do accidents, may nevertheless be less important when judged on the basis of working life as on the average the victim of a fatal accident is younger at the time of death than the heart or cancer patient.

The relation of accident death-rates to over-all death-rates in the 15-19 age-group has been compared for 12 representative countries and the detailed statistics appear as Fig. 1 and Table 1. The deductions which can be drawn from these statistics are illuminating. For example, in 9 of the 12 countries the accident mortality rate is higher than all other causes of death. Of the remaining three countries two have accident mortality in second place. In the diagram it is sufficiently obvious that the accident fatality sector for all countries is large in proportion to the remainder of the circle.

FIG. 1 PERCENTAGE OF DEATHS FROM THE FOUR LEADING CAUSES TO TOTAL DEATHS IN THE AGE-GROUP 15 YEARS IN TWELVE COUNTRIES, 1951-53



procedures and the exchange of information, the proposed yearly meetings of the Board and co-ordination with WHO and, finally a resolution extending an invitation to the Government of the Federation of Malaya,

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### Accidents and working life

The economic and social significance of higher accident rates should not be overlooked. When mortality figures are expressed in terms of "working life" lost, accident ranks at the top together with heart disease, cancer and pneumonia. Examples show that in the year 1945 in the United States, working years lost through accidental death were calculated at 1 750 000 as compared with 1 680 000 for heart diseases, 1 100 000 for pneumonia and 1 040 000 for cancer. Statistics for England and Wales for the year 1954 show that accident moved up to third place on the basis of "working life". Such causes of death as heart disease and cancer which account for more deaths at all ages than do accidents, may nevertheless be less important when judged on the basis of working life, as on the average the victim of a fatal accident is younger at the time of death than the heart or cancer patient.

The relation of accident death-rates to over-all death-rates in the 1-19 age-group has been compared for 12 representative countries and the detailed statistics appear as Fig. 1 and Table I. The deductions which can be drawn from these statistics are illuminating. For example, in 9 of the 12 countries the accident mortality rate is higher than all other causes of death. Of the remaining three countries two have accident mortality in second place. In the diagram it is sufficiently obvious that the accident fatality sector for all countries is large in proportion to the remainder of the circle.

<sup>1</sup> Szerszow, S. Albrecht, R. M. A. Gray, B. (1956) *Bull. W.H.O.* 1956, 15, 123-163

arteriosclerosis expressed as percentage of the total mortality from cardiovascular disease. These statistics reveal that cardiovascular disease and, in many countries, arteriosclerosis alone, cause more deaths than any other disease, cancer included. This significant fact indicates the importance of the problem which these diseases present at the present time.

TABLE 12. DEATHS FROM ARTERIOSCLEROSIS (ALL FORMS) AND CORONARY ARTERIOSCLEROSIS EXPRESSED AS PERCENTAGES OF TOTAL DEATHS DUE TO CARDIOVASCULAR DISEASE ABOVE THE AGE OF 40 IN 1954

Country	Arteriosclerosis (all forms)		Coronary Arteriosclerosis	
	Male	Female	Male	Female
Austria	63.1	50.0	42.9	36.0
Canada <sup>1</sup>	67.3	62.9	51.9	35.0
Denmark	58.4	43.4	41.2	29.6
Finland	61.0	41.0	37.7	17.0
France	18.2	12.7	13.6	2.7
Germany (Fed. Republic)	50.5	43.1	30.1	30.3
Italy	46.4	41.0	11.1	6.0
Japan	19.8	19.9	9.9	3.6
Netherlands	60.6	49.8	31.1	17.0
New Zealand	42.8	46.7	46.3	25.7
Norway	51.0	36.2	34.0	19.6
Sweden	66.4	50.8	31.0	22.6
Switzerland	66.4	53.8	22.0	15.8
United Kingdom				
England and Wales	61.2	62.3	34.0	16.8
Scotland	62.8	62.7	34.6	19.0
United States	66.5	65.2	55.3	41.0

<sup>1</sup> Full-blooded aborigines.

<sup>2</sup> The Yukon and North-West Territories, the Prairie.



TABLE 1. PERCENTAGE OF DEATHS FROM VARIOUS CAUSES TO TOTAL DEATHS IN THE AGE-GROUP 1-15 YEARS  
IN TWELVE COUNTRIES 1951-53

International Abbrevi- ated List	Causes of death (South Revision, 1949)	Australia	Canada	Ceylon	England and Wales	France	Germany, Federal Republic	Italy	Japan	Nether- lands	Sweden	Switzer- land	USA
B1+B2	Tuberculosis, all forms	1.4	8.6	1.2	8.4	7.3	6.1	7.8	10.8	3.4	2.4	5.0	2.7
B8	Dysentery all forms	0.1	0.2	1.2	0.1	0.0	0.1	0.0	12.0	0.2	—	0.0	0.3
B8	Diphtheria	1.4	0.4	0.6	0.2	0.7	1.6	3.2	0.7	4.6	0.1	0.9	0.4
B12	Acute poliomyelitis	3.3	2.6	0.2	1.4	0.6	2.2	0.6	0.4	0.7	1.6	2.3	2.5
B16	Malaria	0.0	—	1.6	0.0	0.0	—	0.0	0.0	—	—	—	0.0
B16	Malignant neoplasms, excluding neoplasms of lymphatic and hemopoietic tissues	7.6	7.4	0.2	10.8	6.3	7.3	4.2	1.3	9.1	11.1	9.6	9.1
B23	Non-meningococcal meningitis	1.5	1.6	0.5	0.9	2.9	1.7	1.6	2.3	1.1	1.0	1.2	1.3
B31	Pneumonia	6.9	7.9	11.7	8.2	8.3	6.4	15.3	9.9	5.4	6.6	3.6	7.3
B34	Appendicitis	1.2	1.3	0.0	2.4	1.4	3.2	1.5	0.7	1.3	2.3	3.3	0.9
B36	Gastritis, duodenitis, enteritis and colitis	3.4	2.3	5.6	1.6	2.0	1.4	11.9	15.1	1.1	1.2	2.6	2.0
B36	Nephritis and nephroses	2.3	1.6	1.5	2.4	1.3	1.5	2.6	2.9	1.3	1.7	1.7	2.2
B41	Congenital malformations	5.9	4.4	0.0	6.2	2.0	2.9	2.2	0.6	6.7	5.6	5.6	5.6
B47+ B48	All Accidents	34.8	36.7	3.8	25.2	18.1	31.7	13.3	12.8	31.1	36.4	34.4	37.9
	Other or unknown causes	30.6	20.6	71.6	32.3	47.7	33.9	37.3	30.4	31.7	22.7	30.0	26.8
B1-B50	All causes	100	100	100	100	100	100	100	100	100	100	100	100

For the years 1952-53 only

TABLE I. DEATHS FROM ALL FORMS OF  
CARDIOVASCULAR DISEASE  
AND ARTERIOSCLEROSIS EXPRESSED AS  
PERCENTAGES OF TOTAL DEATHS ABOVE THE  
AGE OF 40 IN 1964

Country	Cardiovascular disease		Arteriosclerosis (all forms)	
	Male	Female	Male	Female
Australia	57.3	60.3	38.2	30.7
Canada <sup>a</sup>	66.0	58.4	30.6	30.8
Denmark	51.8	52.7	30.3	29.0
Finland	49.3	85.1	30.1	22.6
France	35.7	35.1	6.4	4.8
Germany (Fed. Republic)	41.2	45.9	20.6	19.6
Italy	46.0	52.3	22.3	24.0
Japan	54.8	30.1	9.6	7.5
Netherlands	46.0	40.7	17.8	24.6
New Zealand	66.3	60.6	35.3	27.6
Norway	46.6	50.6	24.0	12.5
Sweden	53.6	55.6	31.6	35.3
Switzerland	47.4	60.3	27.7	22.7
United Kingdom				
England and Wales	52.0	58.4	31.6	30.4
Scotland	56.1	60.7	34.7	21.0
United States of America	60.4	51.4	40.2	33.9

Excluding full-blooded aborigines

<sup>a</sup> Excluding the Yukon and North-West Territories

Excluding the Maoris

arteriosclerosis takes the lead in most countries among the various other forms. It is generally followed by other types of myocardial degeneration, general arteriosclerosis and chronic endocarditis, in that order. In females, however other types of myocardial degeneration frequently take first place.

Table II shows deaths attributed to arteriosclerosis in all its forms, and to coronary

arteriosclerosis expressed as percentage of the total mortality from cardiovascular disease. These statistics reveal that cardiovascular disease and, in many countries, arteriosclerosis alone cause more deaths than any other disease, cancer included. This significant fact indicates the importance of the problem which these diseases present at the present time.

TABLE II. DEATHS FROM ARTERIOSCLEROSIS  
(ALL FORMS) AND CORONARY  
ARTERIOSCLEROSIS EXPRESSED AS  
PERCENTAGES OF TOTAL DEATHS DUE TO  
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	Male	Female	Male	Female
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Italy	46.4	47.0	11.1	6.0
Japan	19.8	19.6	5.9	3.9
Netherlands	50.5	46.6	31.1	17.0
New Zealand	62.6	46.7	46.3	25.7
Norway	61.0	36.2	34.0	19.6
Sweden	66.4	60.8	31.6	23.6
Switzerland	56.4	62.6	22.0	12.6
United Kingdom				
England and Wales	61.3	62.3	34.0	19.6
Scotland	62.6	62.1	34.6	19.0
United States of America	66.3	65.2	65.3	41.0

Excluding full-blooded aborigines

<sup>a</sup> Excluding the Yukon and North-West Territories  
Excluding the Maoris

# Epidemiological and Statistical Information

## MORTALITY FROM ARTERIOSCLEROSIS

Deaths caused by arteriosclerosis are becoming increasingly numerous in practically all countries. This is in contrast to the decrease in mortality caused by other diseases, in particular those of an infectious nature. One of the principal reasons for this increase is the general lengthening of the human life-span coupled with the fact that, as arteriosclerosis affects elderly persons in the main, a much larger number of people are exposed to risk than was formerly the case. Thus with old people there is found to be a kind of "ageing" of the circulatory system which is thought to be to a certain extent responsible for the increased frequency of cardiovascular diseases caused by "wear and tear". Furthermore, improved methods of diagnosis and the spread of medical services are causing a gradual decrease in the proportion of deaths attributed to "senility" or to ill-defined and unknown causes. This explains, at least in part, the increased mortality from certain complaints such as cancer and heart disease.

The whole question of mortality due to arteriosclerosis is therefore of topical interest and a recent issue of the WHO *Epidemiological and Vital Statistics Report*<sup>1</sup> has been devoted to the subject. This analysis has given the statistical data for the years 1952, 1953 and 1954 based on the classification established by the sixth revision of the International Lists of Causes of Death (1948). A previous issue of the *Report*<sup>2</sup> dealt with deaths from vascular lesions affecting the central nervous system and from diseases of the circulatory system. However the present analysis is more restricted and under the designation there have only been included

the various complaints appearing in the International Lists, as follows:

- (1) arteriosclerotic heart disease, including coronary disease,
- (2) chronic endocarditis not specified as rheumatic,
- (3) other myocardial degeneration,
- (4) general arteriosclerosis.

The conditions included in each of these classifications are given in detail in the *Manual of the International Statistical Classification of Diseases Injuries and Causes of Death*.

### Major cause of death

The tables published in the *Report* show that, without any doubt, arteriosclerosis is one of the main causes of death for persons over 40 years of age. Fairly large differences in the rates show between countries and also between the sexes, but in general rates are higher for men than for women. In most of the countries considered deaths due to arteriosclerosis represent between 20% and 40% of all deaths for persons above the age of 40. As can be seen from Table I the percentage varied in 1954 between 6.4% and 40.2% for males, and between 4.8% and 33.9% for females. This wide difference may be due in part to the fact that in certificates for deaths involving heart disease arteriosclerosis is not always mentioned even though it has been present.

Mortality rates from all forms of arteriosclerosis show considerable, though gradual, increases with age. They may be as much as ten times higher for men in the 80-84-year group as compared with the 60-64 and up to fifteen times higher for women. Coronary

important part to be played by the veterinary public health services. This trend has been particularly noticeable in some of the hitherto less well developed countries. Today most national and large municipal health departments employ veterinarians to carry out one or more of the functions included under the general scope already mentioned for veterinary public health work.

### Organization of public health services

Despite the fact that in some countries veterinary public health has been established in the health services as a distinct functional unit, certain other countries have made different arrangements. In fact, no single organizational or administrative pattern for veterinary public health activity can be given because of the varied conditions encountered in different countries. Similarly the pattern of activity varies according to the level at which it is performed. The report of the Group examines what can be accomplished at the national, provincial, district and rural levels.

At the national level, veterinary public health units are usually part of the preventive medical services and the director of the unit is responsible for co-ordinating the veterinary public health operations within the over-all public health programme. He also advises the director of health on all problems that involve animal diseases and human health. The provincial officer also has an advisory capacity but his principal functions are to supervise and administer technical programmes concerned with zoonoses and food hygiene, and to co-ordinate local and national efforts in these spheres of activity.

The local public health unit often has a veterinarian charged with the supervision of zoonoses and food hygiene control. He is responsible to his colleagues in the national and provincial health departments, but must also assume responsibility for maintaining liaison with local groups interested in animal disease problems and public health. On the rural level, where people are, perhaps, most affected by the zoonoses, the veterinarian is

rarely able to devote full-time activities to a single rural district. However part time work can serve as an important component in health efforts, and where there is a lack of veterinarians it is often possible to utilize the services of a trained assistant. It is stressed that rural veterinarians of this type occupy important positions of influence in rural communities because of their importance in the control of livestock diseases, often the most important factor in a rural economy.

### Suggestions for eradicating bovine tuberculosis

With regard to the major zoonoses problems in Europe the Advisory Group examined the situation in the following: bovine tuberculosis, brucellosis, rabies and hydatidosis. Perhaps the most important of these is bovine tuberculosis, which in some parts of Europe is still a serious menace to human and cattle populations. As the report points out, for the effective control of bovine tuberculosis and its final eradication from the cattle population of the country it is necessary to enlist the co-operation of all interested in public health and agriculture activities. In dealing with this most important question, the Advisory Group made six specific recommendations which could be adopted by government authorities in carrying out a bovine tuberculosis eradication scheme. They were:

- 1 The provision of adequate funds to ensure the payment of indemnities to farmers for infected cattle slaughtered, and to cover the costs of technical services involved in the various aspects of the field programme. For these purposes, funds should be obtained not only from agriculture and health ministries, but also from co-operating farmer and dairy organizations.

- 2 The establishment of a price differential for milk from tuberculosis-infected and tuberculosis-free herds.

- 3 The promotion of close collaboration and exchange of information between official medical and veterinary tuberculosis services.

# Reports of Expert Groups

## VETERINARY PUBLIC HEALTH

One of the major activities in present day veterinary public health work is the effective control of those animal diseases which are capable of being transmitted to man—the zoonoses. Although it is not generally realized, these diseases are the source of much ill health and poverty brought about by acute and chronic infections they cause in human beings. They are also the cause of large economic losses in trade and agriculture.

The background to this and other major aspects of veterinary public health work has been examined at a meeting of the Advisory Group on Veterinary Public Health convened by the WHO Regional Office for Europe. The Group's report has just been published<sup>1</sup>.

The first question which must be asked in regard to any discussion on veterinary public health is that of the scope and definition of the work. What are the limits in this particular field of activity? As a general description it could be said that veterinary public health protects and advances human well-being by utilizing the combined knowledge and resources of all those concerned with human and animal health and their interrelationships. Specifically it is concerned with the control and eradication of zoonoses, the development and supervision of food hygiene practices, laboratory and research activities in diseases and conditions common to animals and man and education and training of veterinarians. If the major aspects of veterinary public health work are considered individually as they are in the Advisory Group's report, certain definite factors emerge. With regard to zoonoses,

it is certain that the prevention and elimination of zoonoses in man depends in large part on the control of these diseases in animals. Experience has shown that these diseases cannot be fought satisfactorily by separate endeavours made by health and agriculture authorities. The best approach, as the report points out, is to achieve an effective attack on a specific zoonosis by co-ordinating the efforts of public health, agriculture and other groups.

### Responsibilities for food hygiene

Another major aspect of veterinary public health work is food hygiene. Here the Group limited its debate to certain administrative problems encountered by governmental authorities in carrying out their food hygiene responsibilities effectively. This limitation was deliberate as the Group had noted that considerable technical attention is already being paid elsewhere to the question of food hygiene.<sup>2</sup> Nevertheless the relation between food hygiene and veterinary public health is very close. The veterinarian, because of his special training, is pre-eminently qualified to supervise the major aspects of food hygiene. The Group was of the opinion that wherever possible, food hygiene responsibilities should be unified under one supervisory unit of the governmental services. It was felt that an appropriate unit would be a veterinary public health service. In fact, the important role which can be played by the veterinarian has already been recognized in certain countries where the public health administrations have been reorganized so as to allow a more

WHO HbA Org. Techn. Rep. Ser. 1956, 111, 26 pages.  
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and Spanish.

See WHO HbA Org. Techn. Rep. Ser. 1956, 164, and also  
Circ. WHO HbA Org. 1956, 10.

pathogenic strains, WHO convened a study group, whose report has just been published.<sup>1</sup>

The report stresses that agglutinogens, determined by agglutination and cross-absorption reactions with immune rabbit serum, remain the best criteria for the classification of the leptospirae into serotypes. Standardization of sera, i.e., specific reference sera to be made available to research workers, is one of the fundamental requirements for standardization techniques. The group examined the results of comparative assays of sera corresponding to six serotypes of leptospirae carried out by eight laboratories in different countries. The conclusion reached by the group was that reference sera should be prepared, as far as possible, for all the types and subtypes at present well established, and should be made available in the form of freeze-dried preparations. Reference laboratories, set up in various parts of the world, in collaboration with FAO would then receive the sera and hold them in readiness

for supply to national laboratories and specialist research workers. These laboratories would also provide cultures of leptospiral strains and would assist workers wishing to identify and classify new strains. An additional duty of the reference laboratories would be to train specialist laboratory technicians.

Following the recommendations made by the study group, reference centres for leptospirous have already been designated at Amsterdam, London Tokyo and Washington, D.C. (Additional centres are expected to be designated in the near future.) It is hoped that early in 1957 reference sera will have been prepared for the main serotypes of *Leptospira*.

With regard to the problem of diagnosis, the group describes in the report those methods which it deems particularly suitable for this purpose, namely blood culture and animal inoculation in the initial stage of the disease, and during the second and third weeks the agglutination-lysis test, straight agglutination (microscopic) and the complement-fixation test (of restricted application at present).

WHO Pk 24, Org. bulletin, Sep. Dec. 1956, 115, 11 pages. Price 1/6, 3/6 net, or Rev. 2/- Published in English, French, and Spanish.

## Notes and News

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### Health services in the Seychelles

The WHO public health team at work in the Seychelles Islands, which lie roughly in the middle of the Indian Ocean, consists of an Austrian doctor, a sanitary engineer from Haiti, a Danish nurse and a laboratory technician from Cuba. With the support of the local administration, the public and the press this small team has undertaken the task of organizing an improved system of health services. Money is not plentiful and the islands to be covered are numerous and far-flung. However with the aid of films, lectures and WHO fellowships for study in Tanganyika, Malaya and the United Kingdom, much progress has been made. It is

indeed interesting that some of the short documentary health films shown in the outlying islands are in fact the first films ever seen by the local inhabitants.

The main task of the team leader, the doctor who is assisted by the laboratory technician, is to carry out a morbidity survey in order to evaluate the prevalence of disease among the population and to determine economical methods of control. Although the Seychelles are free from malaria, other parasitic diseases are present. The survey has so far revealed that not a single house or family is free of parasites. In many cases the reason for this is the contamination of the soil in the immediate vicinity of the

and other agricultural groups. This will facilitate the early tracing of sources of human infection from animals, so that appropriate action can be taken by both medical and veterinary authorities.

4 The use of common laboratory facilities for diagnosis research and the preparation of biological products used in the control of tuberculosis

5 The education of the public, in particular the rural population, on the danger of bovine tuberculosis for man, and in the public health and economic advantages derived from its eradication. The full support of the public, both urban and rural is absolutely essential to the success of any control programme.

6 The organization of national advisory councils to guide and assist in the over-all control programme. Membership of this council should include representatives of the government, of medical, veterinary and other professional societies, of farmers and consumers and of other interested groups."

If steps such as those outlined above are going to be taken they must be complemented by suitable training for veterinarians. It is also important that personnel engaged in

public health activities should have the opportunity from time to time to attend refresher courses so that their knowledge may be kept up to date. Indeed, as the Group points out the demands of public health on the veterinary profession can only be met if the veterinarian has been suitably trained for his work. In education, he should be made familiar with the philosophy of the national public health programme, and early in his student years should be imbued with the idea of public service. Opportunities should be afforded so that he may learn the part a veterinarian should take in promoting community health and national welfare, including the philosophy and operation of national public health programmes. The responsibility for this enlightenment lies primarily with veterinary institutions, whether they be universities or autonomous colleges, and due cognizance of this need should be taken in the curricula of veterinary schools. Equally post graduate study by veterinarians in schools of public health, working in close collaboration with physicians in the same classes, is an essential step in providing the trained personnel necessary to carry out adequately any modern public health programme.

## DIAGNOSIS AND TYPING IN LEPTOSPIROSIS

Those animals which commonly carry leptospirae—rodents of various types, pigs and dogs—act as hosts for a large number of different species of these micro-organisms. Although the same species are often found in different animals, each species appears to have a preferred animal host, which is not only the animal most often infected but also the eliminator of the leptospirae and the means of propagating the infection which it produces. Human beings can be infected directly by the animal carrier but infection usually occurs by the carrier eliminating leptospirae with its urine and thus contaminating the environment, particularly water

A large number of differing types of leptospirae have been discovered, with definite host parasite relationships. These strains have different antigenic structures. To differentiate between these types serological reactions rather than clinical symptoms must be relied on. However the great diversity of methods and techniques for differentiation is a source of confusion and makes comparison of results obtained in laboratories in different parts of the world exceedingly difficult.

In order to lay the foundations for a standardization of techniques used in the diagnosis of leptospirosis and the typing of

pathogenic strains, WHO convened a study group, whose report has just been published.<sup>1</sup>

The report stresses that agglutinogens, determined by agglutination and cross-absorption reactions with immune rabbit serum, remain the best criteria for the classification of the leptospirae into serotypes. Standardization of sera, i.e., specific reference sera to be made available to research workers, is one of the fundamental requirements for standardization techniques. The group examined the results of comparative assays of sera corresponding to six serotypes of leptospirae carried out by eight laboratories in different countries. The conclusion reached by the group was that reference sera should be prepared, as far as possible, for all the types and subtypes at present well established, and should be made available in the form of freeze-dried preparations. Reference laboratories, set up in various parts of the world, in collaboration with FAO would then receive the sera and hold them in readiness

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dwellings. It is this problem with which the sanitary engineer is chiefly concerned.

The public health nurse makes personal contact with the womenfolk in their homes and thus is able to assess the magnitude of some of the health problems and at the same time offer useful advice, particularly with regard to the care of children.

### Antituberculosis campaign in the Sudan

A team consisting of an Egyptian doctor, a Norwegian and an Italian nurse has been appointed by the WHO Eastern Mediterranean Regional Office to assist the Government of the Sudan in its campaign to control tuberculosis by BCG vaccination. The team leader Dr Mohamed F Y Khorshed, was until his secondment Inspector of the Chest Diseases Section Ministry of Public Health Cairo.

The Sudan Government is planning to undertake the second phase of a mass BCG antituberculosis vaccination campaign in the southern province, and in part of the central province, in which two million persons will be tested and 700 000 vaccinated. In the course of the next two years the Sudanese Ministry of Health will provide four teams of doctors and vaccinators operating in two stations and two sub-stations. The major part of the supplies and equipment will be sent to the Sudan by UNICEF.

### African seminar on vital and health statistics

In order to explore ways and means of improving or inaugurating medical statistical services in Africa, the Commission for Technical Co-operation in Africa South of the Sahara (CCTA) and the World Health Organization convened a seminar on vital and health statistics in Brazzaville, French Equatorial Africa, from 19 to 24 November 1956. The 20 participants came from a number of different African countries or territories.

In Africa, satisfactory vital and health statistics services exist only in those urban centres where there are enough physicians

to certify causes of death and where there is adequate administrative machinery to collate the information thus obtained. The seminar therefore, had to consider not only the most practical and economical ways in which machinery to meet statistical needs could be developed but also temporary makeshift solutions and the best ways of taking advantage of what sources of information were already available. It was felt, both by health authorities in Africa and by all other branches of the administrations, that adequate planning in all fields of government required a knowledge not only of the geographical distribution and of the age and sex composition of the population but also of its expected rate of growth.

It was considered that the records of hospitals, medical outposts and mobile medical units were the best sources of information on morbidity if not on health in general. Vital registration where it existed, was of course the basic source of information on mortality. With a view to developing vital registration the seminar participants discussed what types of person might usefully serve as substitutes for the regular type of civil registrar. It was also agreed that non-medical persons, such as village headmen, could in selected areas report on rough age and sex distribution and on crude causation of death. Another matter discussed was how estimates, based, for instance on tax registers and voters registers, could replace complete census enumerations, and what particular details might be elicited from sample surveys. The training of various types of officials required for vital registration was also considered.

One of the main conclusions of the seminar was that the need was to obtain numerical information which could serve as a practical guide to health and other administrations rather than to produce orthodox statistics for international publication.

While the primary object of the seminar was the improvement of statistical procedures in Africa, its observations and conclusions might equally well have been made regarding under-developed areas in other parts of the

world. The WHO Expert Committee on Health Statistics, which met in Geneva a fortnight after the African seminar was therefore able to gather from its report practical suggestions which will be brought to the notice of health administrations in other continents.

#### World Health Day 1957

World Health Day 1957 (7 April) will have for its theme "Food and Health" and will be sponsored jointly by WHO and FAO. This announcement was made by the Director-General of WHO in a recent letter addressed to all Member States. Underlining the importance of the chosen theme the Director-General's letter stated, *inter alia*—

*There is, I believe, no country in the world which is not faced with serious problems concerning one or another aspect of the relationship between food supplies, food habits and health situation of its people. It is hoped that as in past years, health administrations will find World Health Day a valuable occasion for making the people of their countries aware both of the broad international importance of this subject and of its particular significance in the national context.*

*On previous occasions executive heads of other specialized agencies have expressed their interest and goodwill with respect to World Health Day observance. In 1957 for the first time however the World Health Day theme is one of equal concern to another of the specialized agencies, in this case the Food and Agriculture Organization, and World Health Day preparations are therefore being made conjointly by our two organizations.*

#### Mental health work in Jordan

One of the papers submitted to the WHO Expert Committee on Mental Health, which met in Geneva between 10 and 13 December 1956, reveals that the mental health services in Jordan have much improved over the past three years, due substantially to the assistance rendered by WHO.

In the Government Mental Hospital at Bethlehem, insulin treatment has been introduced for the first time and electroconvulsive therapy is now carried out as part of the regular treatment. Other types of physical therapy are also being brought into use. The nursing staff of the hospital has received instruction on modern methods of dealing with psychiatric patients and student nurses are given courses in the Bethlehem Hospital lasting for some weeks. The United Nations Relief and Works Agency has assisted the hospital financially and has also appointed a physician to look after the refugee patients in the hospital. Finally an outpatients clinic has been organized and patients visit it from all parts of the country.

#### Africa lacks nurses

One of the main obstacles to the development of public health services in Africa is the shortage of nurses.

In an attempt to improve present conditions, Miss L. Creelman, Chief of the WHO Nursing Section, visited a number of African territories (British Somaliland, Uganda, Zanzibar, Bechuanaland, Mauritius and La Reunion) in order to assess the present situation and to study the measures to be taken in case WHO assistance should be requested. For the same purpose, another WHO nursing consultant, Miss Rosemary Hale, visited the Ombia last August.

In Africa the task facing the nurses is overwhelming. Matrons and senior nurses are fully occupied with everyday activities, and they have only little time for teaching purposes. Even the students themselves have to devote most of their time to routine work, so that they lack opportunity to improve their knowledge. In many instances, there is a severe shortage or even a lack of classrooms and teaching equipment. Finally the steadily growing number of patients imposes an ever increasing burden on the nurses, so that only little attention can be paid to prevention and health education.

Formation of a picked body of nurses is a long-term undertaking. The girls sent for training by governments, sometimes with the

assistance of WHO to Europe or the United States, do not return for two or three years. It is often difficult to divert a nurse from her service for additional training, because there is no replacement and work must continue.

On-the-spot training of a new candidate also entails from three to four years to make a good nurse or a good midwife.

In addition to the nurses, both male and female who were recently sent by WHO to Turkey to perfect their knowledge in the field of tuberculosis control three other nurses from Mauritius, Bechuanaland and Tanganyika were awarded WHO fellowships. Two of them are now attending a two-year course in London, and the third is making a six months visit to the United States. Upon their return, their task will be to train other nurses.

#### Death of Dr Louis Findlay

A public health worker who devoted the major part of his professional career to the organization and development of health services for the care of refugee populations in the Middle and Far East, has recently died in London. Dr Louis Findlay from Scotland, was Chief of the Health Division and the WHO representative to the United Nations Relief and Works Agency. He was also Clinical Professor in the School of Public Health of the American University of Beirut.

Dr Findlay's division in UNRWA was responsible for the direction of the health services provided by WHO for the 900 000 Palestinian Arab refugees whose care and

well-being is the concern of the agency. To this task Dr Findlay brought to bear experience and qualifications which were outstanding. He was no stranger to the refugee problem as from 1951 to 1953 he had served as Chief Medical Officer to the United Nations Korean Reconstruction Agency.

In dealing with the health problems of refugees Dr Findlay always revealed his exceptional ability and humanity. International medicine has indeed lost one of its most valuable members and ardent supporters.

#### Appointment of new WHO Representative to UNRWA

Dr J S McKenzie Pollock who succeeds Dr Louis Findlay has now taken over his new assignment. A staff member of the World Health Organization, Dr McKenzie Pollock has been seconded to UNRWA after a four year assignment as Public Health Administrator in WHO's Regional Office for South East Asia in New Delhi. There Dr Pollock was responsible, under the Regional Director for helping to formulate programmes in communicable disease control and the development of health services in the countries of the region.

Dr Pollock holds degrees of M.B., Ch.B. and D.P.H. from Glasgow University and S.M. from Harvard University. He is also a Fellow of the Royal Society of Tropical Medicine and Hygiene. For some years he held the post of Chief Medical Officer in the British Solomon Islands Protectorate.

# Review of WHO Publications

## MALARIA

Bulletin of the World Health Organization, 1956, Volume 15 Numbers 3-4-5 (pages 361-462)

Most of the articles in this number of the Bulletin were prepared for the Second African Malaria Conference, held in Lagos in November 1955 the Inter regional Conference on Malaria for the Eastern Mediterranean and European Regions, held in Athens in June 1956, and the sixth session of the WHO Expert Committee on Malaria. In the first article, Theory of the Eradication of Malaria, Macdonald analyses the process of malaria elimination, the detection of residual foci and the events following the reintroduction of the disease, and presents a mathematical study of the production of epidemics from small origins, on the grounds of the basic reproduction rate. The paper also gives guidance to administrations that propose to establish a surveillance system after the spraying campaign is over. Surveillance itself is the subject of notes by Chen & Liang, Ayraakisosol & Griffith, and Gunaratna, who describe the systems adopted in Taiwan, Thailand and Ceylon, respectively.

Several contributions deal with the resistance of anophelines to insecticides. Burvine, besides writing at some length on the significance of the phenomenon, presents a short survey of measurements of the susceptibility of different mosquitoes to insecticides. Lavadas & Thymalis relate their observations on the resistance of adult mosquitoes to DDT in Greece, while Echos & Fameliaris describe their findings with regard to *A. sacharovi* larvae, which have recently developed resistance to chlordane and dieldrin in the same country. Chow & Soeparmo report on DDT resistance in *A. sordidus* in Java.

Research on entomological problems relating to malaria is the subject of several articles. Frizzi & Holstein record the finding of an extremely pronounced polymorphism of chromosomes in the salivary glands of fourth-stage *A. gambiae* larvae. This is the first study on the cytogenetics of this species, and for the first time a mapping of its chromosomes is now available. Other studies on *A. gambiae* which appear here deal with its euryphily (Gilles), with the presence of a "mating plug" which makes it possible to recognize nulliparous *gambiae* females (Gilles), and with its biological variations in different regions as compared with similar variations in *A. darlingi* (Giglioli). Gramscotz contributes a note on *A. cinerellus* in the Middle East, and Fand one on the implications of *A. sergenti* for malaria eradication programmes east of the Mediterranean.

More general articles on research include a paper by Wertz on the identification of blood meals of arthropods, an article on the use of radio-isotopes for research on and control of mosquitoes, by Bruce-Chwatt, who also presents an original biometric study which was carried out on a large number of autopsies to determine the weights of the liver and the spleen in Africans and Europeans, with special reference to endemic malaria, and a note by Edington & Lehmann on the interesting and controversial problem of the relationship between the sickle-cell trait and malaria in Africa. The influence of malarial infection of the placenta, so common in equatorial Africa, on the incidence of prematurity is discussed by Archibald, while Garnham draws attention to the difficulties caused by the presence of microsporidia in laboratory colonies of *Anopheles*, one of which is the possibility that pansporoblastia,

lying on the wall of the mosquito's stomach may be mistaken for oocysts. Anophelism in Africa is a subject of great interest and an address entitled "Aspects of Malaria Vector Research in Africa" which was delivered by de Meillon at the Lagos conference in November 1955 is reproduced in this issue. The distribution and habits of the anophelines in French West Africa, French Equatorial Africa and the Cameroons are described by Hamon. Adam & Grjebine and Grjebine presents a survey of the anopheline population of Madagascar.

Following is a series of papers on the epidemiology and control of the disease in different areas. This series begins with an article by Macdonald on the epidemiological basis of malaria control which in non-mathematical language describes the typical stable malaria found in equatorial Africa. The situation in tropical Africa in general is covered by Bernard; that in West New Guinea is described by Metselaar who points out that the holoendemicity of malaria

in the territory does not entirely fit in with the definition of holoendemicity given for Africa and the position in Sarawak and Brunei and in the interior of Borneo is dealt with by de Zulueta in two papers, the second of which is written in collaboration with Lachance. It is in these two papers that the satisfactory results of residual insecticide spraying against malaria carried by the *A. leucosphyrus* group are reported for the first time. Archibald describes the epidemiology of malaria in Northern Nigeria and Joncour malaria control in Madagascar. Ciuca discusses the position with regard to malaria in Romania and Simić does the same for Yugoslavia.

Finally two papers deal with malaria control by drugs: the first is by Houel who describes the use of different drugs for mass treatment in Morocco; the second is by Archibald & Bruce Chwatt who used pyrimethamine successfully over a two-year period to suppress malaria in Nigerian schoolchildren.



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## SCHEDULE OF MEETINGS

18-23 March	Joint ILO/WHO Committee on Occupational Health	Geneva
31 March-13 April	Regional Training Course on Rabies	Caracas
8-13 April	Study Group on Epidemiology	Geneva
8-15 April	Expert Committee on Yellow Fever Vaccine	Geneva
25 April-3 May	Seminar on Mental Health of the Sub-Normal Child	Oslo
7 May-24 May	Tenth World Health Assembly	Geneva
27-31 May	Twentieth Session of the Executive Board	Geneva
2-7 June	FAO/WHO Expert Committee on Food Additives	Geneva
12-15 June	Sub-Committee on Non-Proprietary Names of the Expert Committee on the International Pharmacopoeia	Geneva
24-28 June	Study Group on Histological definitions of cancer types	Oslo

T i m e   t o   d e l e t e

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

## HYGIENE AND PUBLIC HEALTH TEACHING IN EUROPE

"Medical training institutions like all others must improve and adapt themselves to the continual advances in both medicine and social welfare advances which have been particularly remarkable during the last half century" These the opening words of Professor Jacques Larois's introduction to a recently published WHO monograph entitled *The Teaching of Hygiene and Public Health in Europe* give the broad terms of reference for this study. The changes which have come about in undergraduate and post graduate training in hygiene and preventive medicine were brought into prominence at two WHO Study Conferences held in December 1952 at Nancy in France and in July 1953 at Göteborg in Sweden and the authors Professors F. Grundy and J. M. Mackintosh have drawn freely on the material furnished by these two conferences. They have also taken the opportunities afforded by WHO to visit various European countries and there to discuss problems with their colleagues. In order to make this study as internationally significant as possible it was submitted in manuscript for comment to leading public health educators in eight countries representative of different patterns of medical education.

### Public health in history

The monograph opens with a review of the historical growth of the teaching of hygiene and preventive medicine. Although the first national health system arose in Denmark as early as 1740 and was followed a few years later in Sweden by the setting up of a national health council it was not until the close of the eighteenth century when vaccination against smallpox was used on a world wide scale that preventive medicine became universally accepted.

Continuing their historical review the authors stress that the developments in public

health teaching in the latter part of the nineteenth century were greatly influenced throughout Europe by the remarkable progress in the sciences basic to public health especially physiology and bacteriology. At this time rapid changes were taking place and the progress made not only in preventive medicine but in teaching and the dissemination of knowledge was considerable. The rise of public health as a medical career coincided with two developments which greatly influenced the teaching programmes. They were the coming of the "age of environmental hygiene" in which stress was laid on the environmental factors in the etiology of disease and the foundation of the sciences of bacteriology and biochemistry. As the authors point out however administrative changes came only gradually and health insurance for example was not introduced until 1883 in Germany and 1911 in the United Kingdom. But the late nineteenth and early twentieth centuries saw an advance in what the authors term the personal health services and there was little doubt that by the beginning of the Second World War the practice of public health had been "revolutionized within a generation."

### New aspects of public health work

The end of the Second World War brought many changes in the status of the health officer and also to the approach made to the question of studies and training. The gigantic tasks of restoration in a war torn world called for thousands of trained physicians, engineers, nurses and sanitarians. Most countries were faced with the difficulty of turning out trained personnel given teaching methods and courses which were inadequate. As the authors point out "It became clear also that if training were to be undertaken on a considerable scale it would be necessary to give official recognition and



status to the health officers who qualified themselves as well as adequate remuneration and the enjoyment of an honourable profession. Candidates of good quality are not attracted to a profession unless certain simple conditions of status are recognized by the government and the people.

Following the end of the Second World War various types of training courses both theoretical and practical were established. These served immediate needs well enough but in later years it became obvious that more permanent methods would have to take their place. After a period of seven years intensive reconstruction it was felt that the time had come for a review of principles and methods. It was this need which led directly to the sponsorship by WHO of the two Study Conferences previously mentioned.

### Undergraduate training

Having surveyed the historical background of the problem the authors take up the two principal themes of their study namely undergraduate education in hygiene and preventive and social medicine and post graduate education in public health. With regard to the broad aspects of undergraduate education in social medicine the authors express the view that uniformity of curricula is neither possible nor desirable. However they put forward two principles which they feel are probably common to all countries and which have been stressed in all recent reports and discussions on medical education. They are: 1 Undergraduate medical education should be a continuation of general education not merely a vocational training. 2 The undergraduate curriculum should be non specialist in character. Though it should produce graduates who are prepared for advancement by further studies for specialism in any branch of medicine it must take into consideration the fact that most future physicians will be general practitioners. Passing to the physician's task and the relationship between doctor and patient as it affects undergraduate training the

authors comment that the character of medical practice has changed considerably in the course of the past fifty years. The medicine of today is expected to include an effective interest in patients as men and women who lead a particular kind of life in a certain kind of way as persons with family ties and obligations with anxieties hopes and fears. A good practitioner takes into account social and economic factors conditions of work and leisure standards of housing clothing diet and personal habits. He sees the injured worker as a bread winner the women in childbirth as a wife and mother the handicapped child as an educational problem and a source of special anxiety for the parents.

Hence from the beginning of his training the medical student should be led to embrace the notion of a diagnosis which relates both the physical condition and the patient himself to the environment and often especially to those aspects of the environment which are described as social.

Indeed the social aspects of the medical practitioner's work are today linked very closely with the positive promotion of health and the prevention of disease. In one sense there is no dividing line between the medical care of the sick and the prevention of disease. Early diagnosis and therapy are preventive in so far as they arrest the progress of disease and avert complications and disabilities. The effective treatment of some diseases is also the means of preventing new occurrences.

The authors are alive to the defects of undergraduate medical training which must be changed before it can adequately fulfil the various roles assigned to the medical profession by society. They see present day shortcomings in the following terms: 1 The teaching is concentrated almost entirely on the patient in hospital and thus is divorced from the realities of the circumstances in which he became ill and to which he will return on leaving hospital. 2 It tends to have an exclusively clinico pathological outlook and consequently to neglect the relationships between the patient and his environment. 3 In many countries it does not

include adequate instruction in matters upon which health largely depends nutrition housing personal hygiene socio-economic status social security and organized public health and medical-care services 4 The curriculum is overloaded and lacks coherence 5 It is too much concerned with factual detail and too little with method and the development of sound judgement and a critical attitude of mind

The above points refer to medical training as a whole there remains the important role of social and preventive medicine in under graduate education How far short of the requirements of modern medicine and a liberal education would the medical graduate fall if his training were to be confined to the traditional pattern of internal medicine? The authors answer their own question by saying that he might be sadly lacking in both respects Indeed they suggest that a medical graduate with this type of training might very well practise medicine without ever having asked himself "How much of this disease is there? In what circumstances is incidence high or low? How might it be prevented? He might never have formulated the questions What social aids are needed to reinforce medical care? How completely and in what manner are they provided? What is my part as a practising physician in the medical and welfare services maintained by the state and other agencies? What are the wider duties in society of the profession to which I belong? As the authors say there can be little doubt about the vocational and educational inadequacy of medical training which does not raise examine and point the way to answering these and other questions of like nature

#### Basis for teaching programmes

Because of the wide differences which exist between one country and another no curriculum could be framed which would hold good for Europe as a whole Assuming that the normal medical curriculum consists of three periods pre medical pre clinical and

clinical the authors give the following as a typical sequence

"1 Pre medical (first year) During this period the subjects studied usually include chemistry physics and biology and in a few schools additional subjects such as medical history medical sociology psychology and philosophy 2 Pre-clinical (second and third years) The subjects studied include anatomy and physiology biochemistry and histology General pathology and pharmacology are also sometimes introduced towards the end of the period 3 Clinical (fourth year onwards) In addition to formal clinical studies and hospital practice the subjects introduced during this period usually include forensic medicine pharmacology pathology and bacteriology"

#### Introducing new subjects

The teaching of hygiene and preventive and social medicine must also take their places in the medical curriculum There are differing points of view as to the most apposite time for starting this teaching but as is pointed out in the monograph a broad answer to this question was proposed at the WHO Study Conference at Nancy This was

1 The medical curriculum should have a preventive and social orientation at an early stage 2 The teaching of hygiene and preventive and social medicine should be spread over the clinical and to some extent also over the pre-clinical years of study 3 Introductory or orientation courses are desirable at two points a short introduction to medicine in the pre medical year and an introduction to the preventive and social point of view between the pre-clinical and clinical periods of study 4 It would be advantageous to deal with statistical methods and biometry in the pre-clinical period of study" As the authors remind us these conclusions are substantially the same as those reached by a number of national committees in recent years

Examining present day teaching methods and procedures in Europe the authors formulate a number of principles relating espe

cially though not exclusively to the teaching of hygiene and preventive and social medicine at the undergraduate level. In this regard they comment as follows: 1 Teaching methods should take into special consideration the factor of student interest. As far as possible topics should be unmistakably related to clinical medicine by the teaching method adopted and where this is not appropriate their purposes and applications should be explained. Clinical subjects do not need to be justified to the student nor the method of teaching them explained but there are many parts of the social medical curriculum which require that the teacher should explain not only the purpose of each part of the curriculum but also often the teaching method itself. 2 There is an obvious advantage in introducing topics by way of clinical problems and illustrating them by examples with a clinical bearing whenever this is possible. 3 In general teaching methods which give the student an active role are to be preferred and practical exercises should be included whenever they are appropriate. The main object of formal teaching should be to arouse interest and orientate rather than impart factually information. 4 To teach social medicine effectively requires intensive collaboration between the department of social medicine and other departments of the medical faculty and outside agencies.

(a) Since so far as the student is concerned the application of social medicine begins in the wards and out patient departments of teaching hospitals clinical social medicine can be taught partly by traditional bedside methods. This involves as a rule collaboration with clinical departments.

(b) Because the teaching which begins at the bedside extends through a wide range of services into every aspect of community life collaboration outside the faculty is also essential.

### Post graduate training in public health

With regard to the principles of post graduate teaching the authors remark that the main purpose of the post graduate

course in public health is to give the student a thorough working knowledge of the public health services and to bring him into close touch with the practical problems of health administration with which he will have to deal as a health officer. With this aim in view the authors examine the scope of the post graduate curriculum. They state: Theoretical teaching plays only a small part in a course of this kind yet it is necessary in order to direct the student's attention to certain fundamental subjects in which practical applications might be very limited in any one period. Lectures are indispensable in such subjects as public health law, the duties and the powers of a health officer and the legal basis of such everyday matters as housing and environmental health services. The greater part of a teaching course must be closely related to subsequent practice it should therefore include visits with practising health officers to sanitary installations such as water supplies, sewage disposal schemes and other public works as well as to some personal health services such as ante natal and infant welfare clinics, school health services, hospitals, homes for handicapped children and other institutions.

### Functions of public health officers

These views on the scope of a post graduate curricula are not merely those of the authors of this monograph. Rather they might be termed a consensus of opinion stemming from the two WHO Study Conferences. These guiding principles lead to an equally important matter which must be borne in mind in the preparation of any teaching programme namely the precise function of a medical officer of health. In broad terms the authors view the practical functions in the following terms. The health officer deals with man in his environment. He is primarily concerned with the health and well being of the individual, the family and the community in the environmental setting in which they live and work.

It is obvious that preventive and curative medicine cannot be separated. The family

doctor is concerned with prevention when he is called in to care for the sick and the health officer is concerned with sickness when he traces the pattern of an epidemic. Neither of them can be effective in isolation. In team work the family doctor's allies are the hospital and its consultant and specialist staff and at the intimate level of daily practice the nurse and the midwife. In a similar setting the team of which the health officer is leader includes among its principal members the public health nurse, the engineer and the sanitarian. Team work has become accepted practice in many of the health services such as infant welfare, school health work or environmental control."

The authors express some doubt whether the considerable changes which have occurred in the last decade or so in public health practice have been fully reflected in teaching programmes. They comment: "There is a time lag between the demands of day-to-day practice and its realization in teaching methods and the school is often reluctant to change its subject matter until long after its application to the world of affairs is obsolete. In this context we are not dealing merely with the scientific techniques to which reference has been made already. We are regarding advances in social relationships associated for example with improvements in communications, housing and town planning, the formation of neighbourhoods, the care of the aged and the numerous extensions of the concept of welfare. It is of the utmost importance that the health officer should be able to interpret these social changes to the people and their representatives. He does not acquire the necessary knowledge or understand its significance without training and practical demonstration."

## Future prospectus for public health

It is against this background that it is possible to make an assessment of what may be required of a public health officer in the future. Starting with a comment on the change which has come about in the role of the family physician, the authors draw a parallel with the situation in the public health service. "Just as the doctor in general practice should be an adviser on health and sickness to the family as a whole, so the health officer should be a general adviser on health to the community. Since the health services came into existence he has been the recognized leader of a team of workers responsible to governmental authorities both central and local for the health of the people. Of recent years, however, there have been signs of a desire on the part of some members of this team to detach themselves and go their own way. Sometimes veterinary officers, sanitarians and others have felt that their subject was so important that it ought to receive from their authorities independent recognition, yet it was never more vital than it is today to maintain the team spirit in public health. The building of separate sub-departments, each with its own head, is fraught with danger. The integration of the services means as much to the health and welfare of the people as the contributions of the individual professional members."

The monograph concludes with an analysis of information on social medicine, public health and hygiene teaching in the medical schools and institutes of nineteen European countries. For the first time the essential facts have been gathered together and presented in an easily digested form. The chart which accompanies the present article is an epitome of some of the valuable data contained in the final chapter.

# HYGIENE AND PUBLIC HEALTH TEACHING IN NINETEEN EUROPEAN COUNTRIES

Country	University or Medical School	Undergraduate					Post graduate
		Hygiene	Preventive medicine	Social medicine	Public health	Occupational health	Length of course
Austria	Graz	+	+				One year
	Innsbruck	+	+				One year
	Vienna	+	+				One year
Belgium	Brussels	+		+	+	+	One year
	Ghent	+			+	+	One year
	Liège	+			+	+	One year
	Louvain	+			+	+	One year
Denmark	Aarhus	+		+			One year
	Copenhagen	+		+			
Finland	Helsinki	+		+			
	Turku	+		+			
France	Algiers	+	+				One year
	Bordeaux	+	+				
	Cle mont Ferrand	+	+				
	Lille	+	+				
	Lyons	+	+				
	Montpellier	+	+				
	Marseilles	+	+				
	Nancy	+	+				
	Paris	+	+				
	Strasbourg	+	+				
	Toulouse	+	+				
	Nantes	+	+				
	Rennes	+	+				
Germany (Federal Republic)	Berlin (Free University)	+	+	+	+	+	Five months
	Bonn	+	+	+	+	+	
	Düsseldorf	+	+	+	+	+	
	Erlangen	+	+	+	+	+	
	Frankfurt am Main	+	+	+	+	+	
	Freiburg	+	+	+	+	+	Five months
	Gießen	+	+	+	+	+	
	Göttingen	+	+	+	+	+	
	Hamburg	+	+	+	+	+	
	Heidelberg	+	+	+	+	+	
	Kiel	+	+	+	+	+	Five months
	Cologne	+	+	+	+	+	
	Mannheim	+	+	+	+	+	
	Münster	+	+	+	+	+	Five months
	Münster	+	+	+	+	+	
	Tübingen	+	+	+	+	+	
	Würzburg	+	+	+	+	+	
		+	+	+	+	+	
		+	+	+	+	+	
		+	+	+	+	+	

This chart gives a general indication of the scope of undergraduate and post-graduate courses in the various medical schools. Full details are included in Chapter 15 of the monograph.

Medical schools

## HYGIENE AND PUBLIC HEALTH TEACHING IN NINETEEN EUROPEAN COUNTRIES (continued)

Country	University Medical School	University					Period
		Hygiene	Preventive Medicine	Sanitary Science	Public Health	Other	
Greece	Athens School						Only
Iceland	Reykjavik		+				
Ireland	Dublin		+	+			For months (University College)
	Cork Galway	+	+	+			
Italy	Bologna	+	+				Two years (Seven lectures)
	Cagliari	+					
	Catania						
	Florence	+		+			
	Foggia		+	+			
	Grosseto						
	Messina		+	+			
	Modena		+	+			
	Napoli		+				
	Pavia	+					
	Piemonte	+					
	Pisa		+				
	Pordenone		+	+			
	Rome	+	+				
Netherlands	Amsterdam						For months (nine months)
	Groningen						
	Leyden						
Norway	Nijmegen						Five weeks
	Utrecht	+					
Portugal	Oporto	+					Six months (six months)
	Coimbra	+					
	Lisbon	+					
Spain	Barcelona	+	+				Only
	Cadiz	+	+	+			
	Granada						
	Madrid	+	+				
	Salamanca	+	+	+			

University College      Technical College      Royal College      Surgeon      I.I. College

# HYGIENE AND PUBLIC HEALTH TEACHING IN NINETEEN EUROPEAN COUNTRIES (conclusion)

Country	University or Medical School	Undergraduate					Post graduate
		Hygiene	Preventive medicine	Social medicine	Public health	Occupational health	Length of course
Spain (cont)	Santiago	+	+	+			
	Seville	+	+	+			
	Valencia	+	+	+			
	Valladolid	+	+	+			
	Zaragoza	+	+	+			
Sweden	Goteborg	+	+	+	+	+	
	Lund	+	+	+	+	+	
	Stockholm	+	+	+	+	+	Eight weeks
	Uppsala	+	+	+	+	+	
Switzerland	Basle	+	+		+		
	Berne	+	+		+		
	Geneva	+	+		+		
	Lausanne	+	+		+		
	Zurich	+	+		+		
Turkey	Ankara	+					Three months
	Istanbul	+					
England and Wales	Birmingham		+	+			Nine months
	Bristol		+	+			
	Cambridge		+	+			Nine months
	Cardiff		+	+			Nine months
	Leeds		+	+			Nine months
	Liverpool		+	+			Nine months
	Manchester		+	+			Nine months
	Newcastle		+	+			Nine months (University of Durham)
	Oxford		+	+			
	Sheffield		+	+			
	London				+		Nine months (Two Schools)
Scotland	Aberdeen		+	+			Nine months
	Edinburgh		+	+			Nine months
	Glasgow		+	+			
	St Andrews		+	+			Nine months Dundee (St Andrews University)
Northern Ireland	Belfast (Queen's)		+	+			Nine months
Yugoslavia	Belgrade	+		+			Six months
	Zagreb	+		+			Six months
	Ljubljana	+		+			
	Sarajevo	+		+			
	Skopje	+		+			

Charing Cross  
Guy's  
King's College

The London  
Middlesex  
The Royal Free

St Bartholomew's  
St George's  
St Mary's

St Thomas's  
University College  
Westminster

## WORK OF THE LATIN AMERICAN CENTRE FOR THE CLASSIFICATION OF DISEASES

The Latin American Centre for the Classification of Diseases was established within the Ministry of Health and Social Welfare of Venezuela as part of the Division of Epidemiology and Vital Statistics. The formal announcement of this new Centre was made in July 1955 by the Director of the Pan American Sanitary Bureau (Regional Office for the Americas of the World Health Organization). The Centre works under the joint auspices of PASB and of the Government of Venezuela.

The Third World Health Assembly created the World Health Organization Centre for the Classification of Diseases which was established on 1 January 1951 at the General Register Office of England and Wales in London. In view of the proven value of this Centre in solving problems of general interest concerning the application of the *International Statistical Classification of Diseases, Injuries and Causes of Death* it was thought necessary to establish a similar centre for the Americas to consider the problems peculiar to Spanish speaking countries and the use of the Spanish version of the Classification.

The Latin American Centre works in close collaboration with WHO Headquarters in Geneva, the Pan American Sanitary Bureau and the London Centre.

The Centre's general aim is to promote the completeness, accuracy and comparability of mortality statistics in the Spanish speaking countries of the Americas. Its programme was drawn up during a meeting held in Caracas from 27 May to 2 June 1955 by officials of the World Health Organization, the Pan American Sanitary Bureau, the Ministry of Health and Social Welfare of

Venezuela and the Inter American Co-operative Public Health Office which carries on activities in Venezuela.

One of the main tasks of the Centre is to assist and advise health and statistical administrations in the application of the International Classification but it also performs a number of other functions related to the improvement of morbidity and mortality statistics. A brief account of some of its activities is given below.

### Training courses on the Classification

Two training courses have been held at the Latin American Centre for the Classification of Diseases. The aim of the first course was to give detailed instructions on the coding of causes of death to officials responsible for this work in the national vital and health statistics offices as well as to establish close working relations between all Latin American countries and the Centre with respect to problems of medical certification and classification. It was held from 12 to 23 September 1955 at the Caracas Headquarters of the National Hygiene Institute and was attended by 12 students from nine countries. Dr Dario Curiel, Director of the Centre, was directly responsible and was assisted by Mrs Elena Almenar de Ochoa, Chief of the Vital Statistics Section, Ministry of Health and Social Welfare, Venezuela. Twelve sessions were devoted to lectures in almost all of which exercises in coding were given. There were also eight half day sessions devoted to visits, seminars, etc. All the coding sessions included exercises on the application of the rules and their exceptions, supplementary rules, the special problem of tuberculosis, cancer, rheumatic fever, accidents, operations and pre-maturity, questions relating to sex and age factors, late effects, doubtful diagnoses, omission of intermediate cause, etc.

Based on report by Dr Dario Curiel, Ch. of Medical Office, Ministry of Health, Caracas, Venezuela, 15 Dec. 1956.



# HYGIENE AND PUBLIC HEALTH TEACHING IN NINETEEN EUROPEAN COUNTRIES (conclusion)

Country	University or Medical School	Undergraduate					Post graduate
		Hygiene	Preventive medicine	Social medicine	Public health	Occupational health	Length of course
Spain (cont.)	Santiago	+	+	+			
	Seville	+	+	+			
	Valencia	+	+	+			
	Valladolid	+	+	+			
	Zaragoza	+	+	+			
Sweden	Göteborg	+	+	+	+	+	
	Lund	+	+	+	+	+	
	Stockholm	+	+	+	+	+	Eight weeks
	Uppsala	+	+	+	+	+	
Switzerland	Basle	+	+		+		
	Berne	+	+		+		
	Geneva	+	+		+		
	Lausanne	+	+		+		
	Zürich	+	+		+		
Turkey	Ankara	+					Three months
	Istanbul	+					
England and Wales	Birmingham		+	+			Nine months
	Bristol		+	+			Nine months
	Cambridge		+	+			Nine months
	Cardiff		+	+			Nine months
	Leeds		+	+			Nine months
	Liverpool		+	+			Nine months
	Manchester		+	+			Nine months
	Newcastle		+	+			Nine months (University of Durham)
	Oxford		+	+			
	Sheffield		+	+			
Scotland	Aberdeen		+	+			Nine months
	Edinburgh		+	+			Nine months
	Glasgow		+	+			Nine months
	St Andrews		+	+			Nine months (St Andrews University)
Northern Ireland	Belfast		+	+			Nine months
	(Queen's)						
Yugoslavia	Belgrade	+		+			Six months
	Zagreb	+		+			Six months
	Ljubljana	+		+			
	Sarajevo	+		+			
	Skopje	+		+			

Charing Cross  
Guy's  
King's Colleges

The London  
Middlesex  
The Royal Free

St Bartholomew's  
St George's  
St Mary's

St Thomas's  
University College  
Westminster

## Medical certification

Preliminary steps are being taken to organize a seminar on medical certification. The training course planned for 1957 to explain the new rules might serve in part for this purpose. One half of each day could be devoted to classification in connexion with the Seventh Revision and the other half to round table discussions of methods for the improvement of medical certification: the completeness and accuracy of data and the procedures recommended so as to obtain comparable mortality statistics in the Americas. This course is planned for August 1957.

One of the essential aims of the Centre ever since its inception has been the study of methods to improve medical certification of cause of death in areas with limited medical personnel. The joint programme being carried on by the Division of Epidemiology and Vital Statistics and the Inter American Co-operative Public Health Office to improve the registration of deaths and medical certification of cause of death both with and without medical attendance before death has already yielded encouraging results. The report of the technical consultant which has been circulated describes both the procedures and some of the results obtained after the experiment begun at the end of October 1955 in a previously selected area of Venezuela had been under way for four months.

It can be seen from the report that apart from instructions on the use of the international medical certificate directed to all physicians sections have been included in the death certificate for certification of the probable cause of death after investigation by a legally appointed physician when the person concerned dies without medical attention and for the "declaration to the civil authorities of the supposed cause of death when there is no physician available to make out a certificate. The first section" requests a description of the symptoms and a declaration of the probable cause of death based on an analysis of the symptoms, and the second requires the civil authorities in the

absence of physicians to state in particular "the cause of death as reported by the relatives or friends of the deceased person as well as the main symptoms noted by them".

The report indicates that according to the initial results of all deaths outside the chief village of the commune (*municipio*)<sup>1</sup> i.e. in various rural areas only 8 (6%) occurred in cases attended by physicians who certified the cause of death. 117 (83%) were medically certified although these cases had not received medical attention before death and in 15 cases (11%) the alleged causes of death were recorded by the civil authorities purely as given by the family of the deceased without statements from physicians. It is also interesting to note the results when the cause of death was reported by medical officers on the basis of information obtained after death together with the symptoms upon which their conclusion was based. Gastritis and enteritis are the main causes certified in 30 cases. Pneumonia comes next (28 cases) and degenerative cardiac diseases occupy the third place (16 cases) and are followed by tuberculosis, other heart diseases and diseases of the new born (15 cases each). Fourteen cases of malignant neoplasms were reported. Non-infectious diseases peculiar to early infancy and malformations or traumatism at birth were diagnosed in 12 cases. It is noteworthy that these causes although not necessarily in the same order are those which also occupy the highest places in Venezuelan mortality statistics based on medical diagnoses made before death.

Work in the experimental area is continuing. Furthermore general studies on causes of death certified in the absence of an attending physician continue to be given priority in the work of the Centre. In a recent study on gastro-enteritis in Venezuela an effort has been made to correlate information given in certificates of causes of death issued by physicians with information obtained by civil authorities from statements made by families when no physician was in attendance during the illness. A method

The second course was likewise designed to give detailed instructions in the use of the International Classification and was directed principally to persons actually engaged in the coding of causes of death as well as to demonstrate to them the work of the Latin American Centre in the field of medical certification and classification. It was held from 20 to 31 August 1956 also at the Caracas Headquarters of the National Hygiene Institute and was attended by 14 students from nine countries.

### List of causes of death

The diversity of procedures in Latin American countries for the establishment of the main causes of death results in statistics which are not comparable internationally. The Director of the Centre prepared an article proposing an adaptation of List B giving 50 causes of death for use in Latin American countries as a basic list suitable for the uniform extraction for international use of the principal causes of death. This article was published by the PASB in two of its periodicals.<sup>1</sup>

### Coding of samples of death certificates

To bring about uniformity in the coding of causes of death it is planned to develop a system by means of which sample certificates selected at random from various countries will be sent to the Latin American Centre for classification and comparison with the national coding. Before commencing this work it was felt that a preliminary interchange of samples with the WHO Centre in London would be advisable to ensure uniform coding.

For this purpose the Latin American Centre has already selected and coded 580 certificates picked at random from Venezuelan sources to be sent to the WHO Centre in London as soon as the English versions of the certificates have been completed. In

turn the Latin American Centre has received samples of certificates intended for an exchange of coding between England and Wales, Canada and the United States and in accordance with a suggestion by the WHO Centre in London these samples are at present being coded.

The Latin American Centre has received from one country a certain number of certificates regarded as difficult to codify and has sent the country concerned the solutions which appeared most appropriate.

### Development of teaching material

The Latin American Centre has adapted for Spanish speaking countries the film strip on medical certification prepared by the United States National Office of Vital Statistics. The strip consists of a series of 58 pictures accompanied by a commentary. In the adapted version intended for various countries references of a strictly national character have been eliminated and a few examples added where more explanation seemed necessary. A set of diapositives has been prepared for the work of the Centre and has been used in the courses for coders as well as in national courses.

Other steps have also been taken to develop and apply techniques considered to be useful and effective. A programme was prepared which is being carried out jointly by the Inter American Co-operative Public Health Office and the Division of Epidemiology and Vital Statistics consisting of a flip chart which explains and demonstrates to physicians the method of filling up the medical certificate of cause of death. The

flip chart has been put into extensive use in an experimental area in Venezuela in courses and at meetings of health officials and rural doctors. It has met with an excellent reception. As part of the programme mentioned above the Latin American Centre has had the flip chart reproduced in another booklet including the series of figures and an explanatory text in both Spanish and English.

in the growth of cafeteria eating and mass produced meals are examined. As Professor Dolman remarks "In its hunger for animal protein humanity is exposed to a formidable array of potential hazards. The laws of chance various specific immunities and the alimentary juices generally carry the individual through each day without harm from the food he eats. But the odds are being weighted against him by the drastic changes in feeding habits occurring in most civilized communities. As Wilson has lately pointed out

In the communal kitchens practices have been taken over from the home which, though unobjectionable when applied to small quantities of food, present dangers of their own when large masses of food are being handled. In addition a great variety of foods cooked and uncooked processed and unprocessed, contaminated to some degree with potentially dangerous organisms have been coming on to the market and causing not only food poisoning but a wide dissemination of infectious materials among the human and animal population.

"Indeed in due course the inescapably growing propinquity of mankind and the intimate intermingling of man with animals may create new types of danger to health through our food supply which will baffle scientific ingenuity.

"Nevertheless it is not new scientific discoveries that are needed to lessen the waste and misery due to meat borne diseases—or to most other groups of diseases—but rather the effective dissemination and application of currently available knowledge. Of course it is desirable (and unavoidable) that research workers should continue for example to uncover hitherto unsuspected animal reservoirs of potential human disease to investigate the germicidal efficiency of various forms of irradiation applied to foods and to develop new detergents for cleaner washing of restaurant utensils. Meanwhile nevertheless in some parts of the world where poverty is rampant and tradition sanctions custom animal dung may be used for building houses for cleaning floors and for cooking food. In far wealthier countries millions of people daily consume food contaminated with

human faeces through the inadequately washed hands of those who serve them. Certainly we cannot deplore the ignorance which endorses the former state of affairs and yet condone the carelessness and laziness governing the latter. Instead it is fairer and better to recognize that there is room for broadcasting knowledge and awakening conscience in respect of those two fundamentals for reducing the toll of meat borne diseases—temperature control and cleanliness."

### Problems in tropical areas

While the differing aspects of meat hygiene measures in temperate climates have been the subject of numerous studies the rather special problems involved in handling meat and meat products in tropical areas have received less attention. Dr Martin M Kaplan takes up this important matter and gives a description of the particular methods used for ante mortem and post mortem inspection of meat and its marketing in the tropics. He emphasizes that without proper handling after slaughter all efforts which may have been made for improving conditions in the abattoir and for hygienic ante mortem inspection are without avail. "From a public health point of view" says Dr Kaplan "the most elaborate hygienic precautions in the abattoir can largely be nullified by subsequent poor handling of the meat. It is therefore incumbent upon public health authorities to focus their attack where it will be most effective and this will vary according to local conditions. Public health funds are too limited to waste on expensively constructed abattoirs combined with fundamentally faulty hygienic and inspection procedures or on abattoir market or restaurant control regulations with large technical loopholes which serve to create either a false sense of security or a lack of meat products because of unnecessary condemnations. Equally little or no control anywhere along the line usually means human disease uncontrolled animal epizootics the supply of highly contaminated meat to the consumer and enormous wastage because of the poor

has been devised which makes it possible to evaluate the latter type of information and to make use of it in cases not attended by physicians or other medical personnel

Similar studies are contemplated with a view to recognition of the main causes of death in cases where no physician has been in attendance

## MEAT HYGIENE

The importance of meat and meat products in the daily life of a community needs no emphasis. Meat however is a perishable commodity and poor handling and unhygienic preparation very often exact a heavy public health and economic toll. Countries can ill afford the disruption of work caused by meat borne diseases not to mention the considerable wastage and loss to the population of two of its fundamental nutritional needs—protein and fat.

Meat hygiene can be considered as essentially a public health function as its primary purpose is to prevent transmission of disease to man and to provide a safe and wholesome product for his consumption. The secondary objects of meat hygiene practice include the reduction in losses of meat and meat products and the prevention of disease transmission to other food animals.

The entire question of meat hygiene and the safe processing of meat from producer to consumer is treated in a WHO monograph<sup>1</sup> which has just been issued. This study which includes a number of contributions to the WHO/FAO Seminar on Meat Hygiene (sponsored jointly by the Regional Office for Europe of the World Health Organization and the Food and Agriculture Organization and held in Copenhagen from 22 to 27 February 1954) revised and brought up to date where necessary is primarily designed for veterinarians, medical officers, sanitarians and other public health workers.

Besides dealing with the practical health problems of the meat industry from the ante-mortem care of slaughter animals to the hygienic processing and marketing of meat and the sanitary disposal and reclamation

of by products it covers such wider aspects of meat hygiene as the epidemiology of meat borne diseases, the training of meat inspectors, the current meat hygiene practices in a number of European countries and the special meat hygiene problems in the tropics.

### Epidemiology

For a discussion of the numerous processes involved in the production of safe meat it is essential to have a good understanding of the epidemiology of meat borne diseases. This important subject is dealt with at length by Professor C. E. Dolman in the first chapter of the monograph. After reviewing the efforts made by man through the centuries to bring about effective meat control measures—and in this connexion it is interesting to note that only rudimentary meat inspection was carried out in a few cities in the United States before the year 1884—the author classifies meat borne diseases under the following three general headings:

- (1) meat borne diseases of chemical or toxicological origin
- (2) endogenous (intravital) animal infections transmissible to man by meat (zoonoses)
- (3) infections and intoxications due to exogenous (human and environmental) contamination of meat and manufactured meat products (e.g. bacterial food poisoning)

Various typical examples of conditions falling under the three general headings are considered from an epidemiological point of view. In general terms the dangers implicit

# MEAT HYGIENE

Illustrated lecture based on material received from WHO memorandum reviewed by the committee

Sanitary practices whether related to the slaughter care of the animal or the killing condemnations of diseased meats safeguard against substandard contamination or any one of the fatal dangers to the safe consumption of the product—all designed to protect the production of sound and wholesome meat—a matter which is of daily growing importance now days one of the most modern devices for improving slaughter is a electrically operated. A study of patterns as follows in different parts of the world but the only principle seems to tally the same. To be effective the current must pass quickly through the animal's brain to produce what has come to be known as instantaneous death. This requires a sufficient current to produce paralysis of the respiratory system but at the same time not get high enough to cause tissue undesirable changes in the tissues.

The current is switched on immediately the voluntary muscles contract and the animal falls over (1) the drop is noiseless to the ground (2) the animal is gently extended or flexed according to the species and respiration ceases. After about 10 seconds the reflexes relax and the animal remains in a comatose condition. The process usually lasts for about 60 seconds. This method is practiced with a few seconds after the electric shock. The animal is then bled.

The Japanese have developed a similar method but the gas hydrogen cyanide has gone further and developed the strychnine method which delivers a rapid dose of within seconds.

The use of such conditions as saturation of the tube ulcers or anthrax in animals is the risk of transmission. To the same may be added with the risk of leptospirosis cysticercosis and the possibility of acute epileptic conditions to mention a few which



keeping qualities of such meat. Education in food hygiene should start in the schools to help create a public which would not countenance unhygienically produced and sold meat. A very valuable procedure is the encouragement of sanitary methods by fostering healthy competition among food producing and retailing establishments through the award of a certificate of merit.

Progress in meat hygiene in tropical areas rests largely on parallel economic development and health education of the public. Such progress is not inevitable; concrete measures have to be taken and steadily applied with the precaution that the goal set should not be out of view of the immediate practicalities of any local situation.

### Slaughter

The contribution by Dr Roger N. Benoit which is devoted to a detailed examination of the construction, design and operation of a modern abattoir is of practical importance to public health workers in all countries and particularly those concerned with problems of meat hygiene. Current thinking has brought about a change in attitude towards the abattoir. It is a factory in which cattle and other live stock are slaughtered for conversion into meat. It must cease to be a mere agglomeration of primitive buildings and sheds unhygienic both for the men who work in them and for the housing of animals and the preparation of carcasses. Dr Benoit is also convinced that the abattoir system should be a public service with an independent budget. His analysis of abattoir operations covers every aspect from lairage to waste product recovery.

Consideration of abattoir construction leads naturally to the question of modern techniques in slaughtering food animals. There have been various mechanical methods in use in the course of the last half century and recently a number of countries have adopted electrical stunning for both large and small animals. Dr Phyllis B. Croft points out that although there has been some divergence of opinion in the past on the

efficacy of the latter method, if properly applied it could undoubtedly prove useful as it is quiet compared with other types of humane killer and is at the same time very effective. For success it depends on the passage through the animal's brain of an adequate amount of electricity in a sufficiently short period of time. But this in turn depends largely on the voltage applied and on the resistance. Dr Croft examines this and various other technical problems which still have to be surmounted and also outlines the progress which has been made recently in different stunning processes.

### Meat hygiene practices in Europe

A chapter devoted to meat hygiene practices in Europe is based on replies made to a WHO questionnaire circulated to a number of European governments. With regard to meat inspection it appears that there are many countries where the division of responsibility among government departments is not clear. Although no uniform pattern exists, it is true to say that the effective operation of a meat hygiene service must rest on the close working relationship between medical, veterinary and sanitary engineering workers.

Although there is no standard meat hygiene legislation which is generally applicable in Europe, it is clear from the answers given to the questionnaire that much of it is similar in content and does result in practical and effective supervision.

Information regarding meat hygiene practice has been submitted generally for the so-called food animals—the term used in meat inspection legislation. These animals include cattle, calves, sheep, pigs, goats, horses, donkeys, reindeer and even bears and whales (Norway). In most of the countries covered by the survey it is not permissible to sell meat or meat products for human consumption which have not been submitted to official meat inspection. There are, however, certain countries where local conditions demand a certain flexibility in the application of legislation. Included in this category are Finland

DDT were sufficient to delouse a person a few years later three times this amount was necessary

Similar information came from Egypt where DDT dusting had been applied every 3-5 weeks as a routine public health measure. In 1953 a resistant louse strain was reported from the Cairo region

#### WHO survey

In view of the growing threat represented by this resistance WHO undertook, in 1953 a world wide survey of insecticide resistance in lice in order to assess the extent of the danger. Up to 1956 51 national health administrations had agreed to take part in this survey which was to be carried out according to a uniform method with the aid of an experimental kit supplied by WHO. The results of tests conducted in 37 countries including more than 180 localities have just been analysed in an article published in the *Bulletin of the World Health Organization*<sup>4</sup>

The test consisted in determining the mortality of lice (*Pediculus humanus corporis* de G.) which had been placed for 24 hours at 25°C in darkness on a piece of cloth treated with insecticide powder in the following concentrations: DDT 0.1, 0.5, 1, 5, BHC (gamma isomer) 0.25, and 0.5, synergized pyrethrins 0.02, and 0.04. Two samples of 10 or 20 lice recently taken from human beings were to be tested on three successive days (making a total of six replicates) at each concentration. Analysis of the results from this test indicated that a mortality of 90% was representative of a normally susceptible strain while 83% already indicated significant resistance and 72% typical resistance such as was reported from Cairo in 1953.

#### Results of the survey

Despite reservations which must be made regarding the extrapolation of results based only on a few samples to an entire country—

reservations which will be discussed later—certain general features emerge from this survey.

In Europe there is no marked resistance with the exception of a sample from Portalegre (Portugal).

In the Eastern Mediterranean countries susceptibility is distinctly lower than in Europe or the adjacent Asian countries. Three out of five samples in Jordan coming from refugee camps whose occupants had been subjected to regular dusting by staff of the United Nations Relief and Works Agency showed a mortality of less than 72%. The same is true of most of the Egyptian strains and of several Turkish and Syrian strains. One sample from the Gaza region even had a mortality as low as 33%.

Among the Asian countries Afghanistan, India and Pakistan report mortality figures which do not indicate any abnormal resistance. In Iran on the contrary resistance was found in all localities where DDT had been used. From Teheran the exceptional case was reported of a man who regularly supplied lice for studies on the transmission of disease by these insects and who had been using DDT periodically. In this case the mortality of the lice had fallen to 21%.

In Japan all the samples undergoing the test were resistant, the Tokyo strains being in no way inferior to those from Korea. A Kobe strain bred since 1954 in the presence of DDT gave in 1956 after 10 generations a mortality of 21% comparable to that of lice from the subject in Teheran mentioned above.

In French West Africa—Sudan, Haute Volta, Niger—where dusting has been rare, susceptibility remained normal. On the other hand at St. Louis (Senegal) and Conakry (French Guinea) resistance was high. In Northern Nigeria where dusting is not regularly carried out everywhere at least takes place occasionally, susceptibility seems to be decreasing and gradually approaching the level shown by the Cairo strains. Two samples from the African townships of Queenstown and Eskeaton, Union of South Africa with mortalities of 18% and 14%



carcasses and organs. This examination is required by law in certain cases in all the countries except Italy, Morocco, Spain, Tunisia and the United Kingdom. However, in some of these it is in use although not compulsory by law.

One further examination of meat mentioned in the survey is that for trichinosis. Pigs must be examined trichinoscopically in slightly less than half the number of countries covered by the survey and in certain others there is legislation with regard to the inspection and examination of pork.

This survey of meat hygiene practices in Europe concludes with some information on the handling and transportation of meat. It is of interest that legislation is now in force

in all the countries covered which prescribes approval for all establishments intended for use and in use as slaughterhouses and all premises where meat or meat products are stored, processed and/or sold. Premises covered by this legislation are under constant public health supervision and control in the countries concerned. With few exceptions all countries have regulations in force governing the maintenance of cleanliness in handling and transportation. With regard to personnel engaged on work connected with processing of meat, it is found that slightly more than half the countries submitting information have regulations which demand physical examination for communicable diseases of such staff both before and during employment.

## INSECTICIDE-RESISTANCE IN LICE

Between January and March 1951 members of the armed forces of the Republic of Korea were subjected to DDT dusting. Despite the improvement in general hygiene and despite dusting it was found with surprise that there was a constant increase in lice infestation. Indeed during the first three weeks of May 1951 the percentage of infested subjects rose from 38.5% to 49.2% and then to 51%. Laboratory tests confirmed that with certain strains of lice doses of DDT which killed 100% of controls bred out of contact with the insecticide caused only a 46% mortality among those which had been exposed to DDT.<sup>1</sup>

This latter development was not new. In Japan and Korea DDT had been used successfully at the end of the Second World War, more particularly during the 1945-1946 typhus epidemic.<sup>2,3</sup> Regular DDT dusting in prisons, hospitals, reception centres and repatriation camps had been applied to more

than two million persons. From 1946 to 1950 the Allied occupation forces in Japan also employed DDT although less intensively. After the outbreak of the Korean war the use of DDT again became general. However as early as 1948 the Japanese Press had reported certain failures in reception centres where persons treated with DDT were not freed from lice. The observations made in the field were again confirmed in the laboratory. Lice from clothing already treated with DDT were more resistant than those which had been bred in the laboratory away from the insecticide. Thus the effectiveness of DDT delousing became doubtful and the question arose as to whether it might not be preferable to give up the regular use of DDT and to employ it with its full effectiveness only in the event of some emergency—the threat of an epidemic for example.

The resistance of lice continued to increase. In 1948 lice which had been exposed to certain DDT concentrations under particular conditions died within 42.54 hours. But in 1951 under the same conditions they survived until the fourth or sixth day. Furthermore, although at the outset about 30 g of

11 lb 1 H S Alma R M & N b y C (1952) *SI* 4  
115 11  
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11 lb 1, 11 S P m y R L & S 1 b A (1954) *Am*  
*J t op M d* 3 9

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respectively were the most resistant strains encountered in the survey even surpassing those from Korea in this respect

The results from the Americas were of considerable interest. The susceptibility of lice in Mexico City where there is regular dusting was equal to that of lice from Guatemala City where there is none. In Peru it was found that in the town of Arequipa where DDT was only used occasionally susceptibility was normal. However in treated towns such as Corao and Cuzco susceptibility had diminished mortality figures being 44% and 65% respectively. In Bolivia no samples were tested but it was noted that each successive dusting was effective for a shorter period.

Considered as a whole the figures for DDT resistance show that the DDT susceptibility of lice in regularly dusted areas is consi-

derably less than in areas never or rarely dusted

#### Susceptibility to other insecticides

Susceptibility to gamma BHC remained intact in most of the samples examined although there were several exceptions to this rule particularly in the case of samples from Japan. It would seem that the high resistance to this substance there might be attributed to the general use of BHC in Japan since 1952. The pyrethrins did not seem to have given rise to any resistance except in Japan where certain strains showed a mortality of only about 10%.

#### Variability of resistance

Mention has already been made of the danger of generalizing and extrapolating

PERCENTAGE MORTALITY OF BODY LICE OBTAINED IN SOUTH EAST FRANCE

	N umber of samples	N umber of lice	P ercentage mortality			
			24 hours	48 hours	72 hours	96 hours
<b>DDT at 0.1 /</b>						
susceptible	95	838	84	100		
sub susceptible	18	240	14	36	100	
sub resistant	3	8	0	3	33	100
relatively resistant	1	7	0	0	8	31
resistant b	1	56	0	0	10	10
<b>γ BHC at 0.25</b>						
susceptible	73	896		100		
sub susceptible	1	70	0	0	100	
sub resistant	1	12	0	15	33	100
<b>Py ethrins at 0.02 /</b>						
susceptible	635	844	96	100		
sub susceptible d	1	12	0	33	100	

Data obtained from Nicoll R M & Sautet J (1955) *Moogr Inst Nat Hyg* 8  
North African at Marsilles

a b Frenchman from the Upper Var

Malagasy at Marseilles

d Negro from Oran

from local results to the regional or national levels while at the same time failing to recognize individual variations. Two examples will suffice to make the problem clear. The first concerns the survey carried out in Greece the results of which might have led to the belief that resistance in lice was unknown there. More careful examination however showed that 2 out of 21 of the samples collected actually showed a degree of resistance in one case corresponding to a mortality of 31. The second example is taken from an intensive study by Nicoli & Sautet<sup>8</sup>. These authors tested more than 100 strains of lice collected from transients in a night shelter at Marseilles. They examined the strains from each individual separately and came to the conclusion that

resistance can vary from one individual to another. They isolated and bred strains which were DDT susceptible (by far the most numerous) sub-susceptible sub-resistant and relatively resistant as well as one strain which appeared completely resistant but whose larvae were not viable. In the case of this latter strain no mortality attributable to DDT was observed after 120 hours (see Table). Referring to the possible consequences arising from the existence of particularly resistant strains Nicoli & Sautet conclude "the existence of strains of lice with a lower susceptibility to halogenated contact insecticides combined with the sometimes rapid movements of their human transient hosts represent a potential threat to the population since nobody knows whether the lice which today are harmless may not tomorrow be dangerous."

Nicoli R M & Sautet J (1955) *Mémoires de l'Institut Pasteur*

### *Stability of rabies vaccines*

Because of the different climatic conditions found throughout the world it is of the utmost importance for every country to determine the stability of the vaccines produced and used. Where facilities for adequate and continuous refrigeration are available properly produced nervous tissue vaccines should remain stable for several months. Experimentation however should be based on results of a series of potency tests for duration of antigenicity. Where there is a decentralization of vaccine treatment centres and vaccines may not be properly refrigerated during transit or storage it is especially important to determine by means of potency tests the maximum permissible expiration date for the vaccines. When such a date is reached it is best to destroy the vaccine if unused, rather than perform another potency test for the purpose of extending the preparatory date because experience has shown that vaccine suspensions may unpredictably and suddenly lose their potency upon prolonged standing.

Phenolized vaccine which has inadvertently been frozen should be discarded.

Since the efficacy of living chicken-embryo vaccines depends upon a critical amount of virus being present at the time of inoculation such vaccines should be kept dried and refrigerated if used after reconstitution they should be used immediately.

From the Third Report of the WHO Expert Committee on Rabies *World Health Organization Reports* 1957: 123.

# DEVELOPMENT OF MATERNAL AND CHILD WELFARE IN TURKEY<sup>1</sup>

Infant mortality and the protection of child health are matters of capital importance for Turkey a country that is still sadly under populated and lacking in the requisite manpower fully to exploit its national riches. Year after year the relatively high mortality among infants and to a certain extent too among pre school age children takes a serious toll of the country's potentially productive population.

Recognition of this situation led the Turkish Government to seek the help of the World Health Organization through its Regional Office for Europe as a first step towards setting up comprehensive maternal and child welfare services throughout the country. This preliminary phase began in September 1954 when a WHO team arrived in Turkey to set up maternal and child health demonstration centres in Ankara and Izmir in all four were established.

It rapidly became apparent however that extension of the programme to provincial health centres as originally planned would require the prior setting up of an administrative service staffed by senior officers capable of co-ordinating and integrating the various elements working in the maternal and child health field as well as the provision of more and more trained staff at all levels.

## Large-scale health services plan

From these beginnings Turkey has developed an all embracing plan of a magnitude that may have repercussions on the whole economy of the country. A series of health social and educational measures entailing far reaching re organization and extension of the existing public health services is envisaged. Eventually there will be health centres in every principal town through

out the country together with some 6500 additional health stations to bring the public health services within the compass of all sections of the population.

The health centres—which had already been planned prior to the developments in maternal and child welfare—are intended to take care of both the curative and the preventive aspects of public health and it is now proposed to attach to them pre and post natal clinics.

The provision of staff forms a major part of this ambitious programme since it is obvious that large numbers of additional doctors nurses midwives and auxiliary personnel will have to be recruited. Experience has shown that despite adequately trained staff preventive services are often unsatisfactory where effective direction and supervision are lacking. Hence the availability of senior staff is also considered a prerequisite for success.

It is therefore planned to supplement the existing permanent establishment of public health directors and medical officers by appointing 32 regional consultants in paediatrics and obstetrics from among the regular hospital staffs to act as technical advisers to the Ministry of Health and by setting up a permanent inspectorate composed of about 400 persons or one to every 25 basic staff members to be responsible for supervising and guiding the work of the maternal and child health nurses and midwives.

## Training Programmes

A large training programme is envisaged to provide the thousand or so physicians that are needed (two per district) with the requisite training in child welfare and to extend the rural midwife service by forming a pool of nurse midwife assistants numbering some 10 000 or one to every 2500 inhabitants. It is planned in addition to make use of girls from the villages acting in a voluntary

<sup>1</sup> The material is based on information furnished by Dr Karabudak, Deputy Secretary of Health, Ankara, and Dr H. M. W. T. M. Le D. N. T. R. K. y. C. i. (I. r. n. t. l. C. h. i. l. d. r. e. n. C. e. n. t. r. e. ) 1956 6  
511 514

capacity to help in the work of the nurse midwife assistants after some local training. This last measure is expected to prove of value in awakening public interest in health matters and in promoting recruitment of staff. Special training will also be provided for senior medical staff i.e. public health directors, medical officers and regional consultants as well as for executive medical officers to take charge of the district health centres.

It is recognized too that the work of the public health nurse to be fully effective from the standpoint of both preventive medicine and maternal and child health must be fitted within the general framework of public health measures. The functions of the existing public health agents numbering some 4000 in all are to be broadened so as to ensure close co-operation and record services will be set up as a means of obtaining a general picture of environmental conditions.

In every case training programmes will be realistic and adapted to the actual functions to be performed so as to extract the maximum practical value from the instruction given. In addition to the training facilities already existing all of which—medical faculties, specialized institutes and specialized

services alike—will be mobilized in this effort a special school is to be set up in Ankara during 1957 for the training of inspectors and tutors in preparation for the subsequent expansion of training at the lower levels. A special committee has already been established for the co-ordination of the training programme. The demonstration centres set up with the help of WHO will be focal points for much of this training work and WHO staff are also directly assisting the section that is responsible for the recruitment and training of all nursing staff.

At the national level the plan provides for the setting up of (a) a special section within the Ministry of Health to deal with the overall direction and co-ordination of child welfare (b) a higher technical advisory board composed of senior public health officials and paediatricians and (c) a national association of private child welfare societies whose help is needed if the programme is to be carried to a successful conclusion.

WHO will be taking an active part in the programme by providing technical guidance and assistance. UNICEF will also be contributing in the form of supplies of equipment and material. A start on the work has already been made and the whole programme is expected to be completed in some 15 years.

## Epidemiological and Statistical Information

### MORTALITY FROM MULTIPLE SCLEROSIS

A recent number of the WHO *Epidemiological and Vital Statistics Report*<sup>1</sup> is devoted to mortality from multiple sclerosis in thirteen European and seven non-European countries. The information given is of particular interest as this is the first occasion on which

international statistics on this subject have been collected.

It is common knowledge that in spite of research for more than a century the etiology of multiple sclerosis still cannot be precisely defined. At the outset this illness was considered as a kind of medical curiosity but it is now recognized as a disease which is more common than was supposed.

<sup>1</sup> *Epidemiol. et Statist.* 1966, 9: 595-608 (No. 11). This number also contains recent morbidity and mortality figures relating to poliomyelitis, tetanus and smallpox.

**MORTALITY FROM MULTIPLE SCLEROSIS IN 1952-54 BY SEX AND AGE**

Rates per 100 000 population (yearly ave age)

Country		All ages	Age groups in years								
			- 10	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80 & +
AMERICA											
Canada	M	12	—	01	03	14	20	32	36	46	41
	F	11	—	01	06	11	29	19	30	23	27
United States All races	M	09	—	—	02	07	14	19	6	33	31
	F	10	—	01	04	10	18	22	22	23	2
White	M	09	—	—	02	07	15	20	28	34	33
	F	10	—	—	03	10	20	23	23	24	24
Non white	M	04	—	—	03	04	07	10	19	11	05
	F	04	—	01	06	07	07	09	07	08	—
ASIA											
Japan	M	01	—	—	—	01	01	01	04	06	02
	F	01	—	—	—	—	01	01	02	02	09
EUROPE											
Denmark	M	1	—	—	06	28	46	3	60	29	12
	F	2	—	—	07	30	48	54	33	16	09
Finland	M	08	—	—	05	07	10	24	35	42	27
	F	06	—	01	04	03	14	14	18	15	—
France	M	31	01	01	03	08	15	26	75	238	575
	F	31	—	—	04	11	19	28	46	133	403
Germany Federal Rep	M	18	—	—	05	18	30	39	42	42	102
	F	25	—	01	08	27	41	50	44	39	82
Ireland	M	6	01	01	06	26	78	65	57	34	17
	F	25	—	—	08	39	40	69	37	62	77
Italy	M	06	—	—	01	04	11	14	24	27	11
	F	06	—	—	03	08	11	15	17	13	07
Netherlands	M	17	01	01	05	21	43	38	36	36	05
	F	21	—	—	10	7	45	50	51	27	11
Norway	M	18	—	—	06	14	3	37	51	42	28
	F	16	—	—	06	15	35	32	19	47	—
Sweden	M	09	—	—	04	09	19	26	16	06	—
	F	12	—	01	09	11	26	22	2	10	11
Switzerland	M	17	01	—	06	14	27	40	52	34	13
	F	0	—	—	11	31	44	79	58	53	08
United Kingdom											
England and Wales	M	14	—	—	04	16	23	32	34	20	15
	F	2	—	01	09	23	40	48	34	22	11
Scotland	M	30	—	—	07	30	61	69	77	44	50
	F	34	—	01	11	44	68	76	62	41	16
Northern Ireland	M	27	—	—	07	42	44	65	80	33	—
	F	38	—	03	20	57	97	83	59	26	—
OCEANIA											
Australia	M	05	—	—	02	03	09	11	17	21	33
	F	09	—	01	04	07	13	24	3	18	17
New Zealand	M	11	—	—	02	10	06	55	39	24	—
	F	13	—	—	02	17	19	35	30	28	3

Multiple sclerosis may affect any part of the central nervous system. It is sometimes classified as a disease of the medulla because many of its symptoms develop as a result of medullar lesions. The disease may appear at any age but it is most common in the 20-40 age groups. Its evolution is slow but progressive. sufferers may live from 10 to 15 years.

In the 18 countries for which figures are published in the Report in question mortality from multiple sclerosis represents from 0.1 /

to 0.3 / of general mortality both during recent years and in the period preceding the Second World War. The highest death rates are noted in Scotland, France and Northern Ireland. In the period 1952-1954 mortality rates per 100 000 persons varied with respect to males from 0.1 in Japan to 3.1 in France and with respect to females from 0.1 in Japan to 3.8 in Northern Ireland (see Table). In general the rate is a little higher for women than for men.

## Notes and News

### International transfer of dogs and cats

The WHO Expert Committee on Rabies considered it useful in its third report<sup>1</sup> to repeat with slight modifications the general recommendations concerning the international transfer of dogs and cats made in its second report "without attempting to cover the many different situations faced by countries throughout the world."

1 Countries now free of rabies should continue either to prohibit the importation of dogs and cats or to subject them to a prolonged period of quarantine preferably six months at the port of entry.

2 Where strict quarantine measures are impracticable such as in countries with extensive land borders and in which rabies is already present in domestic or wild animals the following procedures are recommended:

(a) Animals (dogs and cats) should be vaccinated more than one month but within 12 months before departure with inactivated vaccine or Kelev strain vaccine or within 36 months before departure with Flury strain vaccine the vaccine having previously passed satisfactory potency tests.

Certificates signed by the appropriate veterinary authorities in the country of origin should accompany each animal. (The third

report of the committee gives a suggested certificate.) Where any doubt exists with respect to the potency of the vaccine used in the animal's country of origin the animal should be considered as unvaccinated.

(b) Unvaccinated animals should be vaccinated upon arrival and quarantined for not less than 45 days or where quarantine measures are impossible to apply the animal should be kept under surveillance for a similar period and not allowed to run at large.

3 In countries free of rabies but where prolonged quarantine measures cannot be invoked 2(a) and 2(b) may be applied. This recommendation should not be construed however as discouraging more stringent measures such as longer quarantine or restraint periods upon entry where applicable.

### International drug control

Two analgesic drugs of morphine like character have now been brought under international control following action taken by the World Health Organization in conformity with the provisions of the Protocol of 19 November 1948. This protocol is specifically concerned with the control of those drugs which are outside the scope of the earlier Narcotics Convention of 1931. Article 1 of



the 1948 Protocol requires States who are Parties to notify the Secretary General of the United Nations of drugs which may be harmful and which do not come within the scope of the 1931 Convention. In the case of the two drugs which have now been brought under international control—

a 1 methyl 3 ethyl 4 phenyl 4 propionoxy piperidine and its salts

1 [2 (p aminophenyl) ethyl] 4 phenylpiperidine-4 carboxylic acid ethyl ester and its salts

—the original notification was submitted by the Government of the United States of America. This notification was referred by the Secretary General of the United Nations to the World Health Organization and on 22 November 1956 the Director General of the World Health Organization informed the Secretary General that both drugs were capable of producing addiction and WHO "has therefore decided that they shall fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1 Paragraph 2 Group I of that Convention. It will be recalled that the 1931 Convention limits the manufacture and regulates the distribution of narcotic drugs.

The final action in this matter was taken by the Secretary General of the United Nations who on 20 December 1956 transmitted the World Health Organization decision to all States party to the 1948 Protocol.

### International biological standardization

The international standardization of pertussis vaccine was successfully completed in 1956. This achievement was based on three main results of the efforts made during the post war years. Large scale field trials proved that different preparations of pertussis vaccine possessed a different immunizing potency and that the best preparations had a high protective power in children. Laboratory tests carried out with the same preparations showed that the degree of protection afforded by a pertussis vaccine can be predicted by assaying its potency against a standard vaccine in mice. Finally the proposed inter-

national standard vaccine was shown to be a highly stable preparation.

Against the background of this success the Expert Committee on Biological Standardization of the World Health Organization examined the work in progress with other vaccines<sup>1</sup>. For some such as smallpox vaccine and poliomyelitis vaccine a lack of stability had so far prevented the establishment of an international standard preparation. Fortunately in 1956 very stable freeze dried preparations of smallpox vaccine have become available and since the correlation between laboratory assays and the efficacy in vaccination of humans has also been established for this vaccine the date of its international standardization cannot be far off.

For some other vaccines no direct solution of the standardization problem is available at the present stage. These include typhoid and cholera vaccines. Though we can be reasonably certain that some preparations of these vaccines confer a good measure of protection the laboratory assays so far developed do not permit us to predict this prophylactic effect in humans with sufficient confidence.

The fact however that international standardization of vaccines is now being realistically undertaken marks the progress in this unspectacular but important task of providing units of measurement for complicated biologicals.

At the same time the Expert Committee has initiated its programme of antivenin standardization. Emphasizing that the principles of standardizing antivenins are analogous to those of standardizing bacterial antitoxins the Committee now plans to go ahead with the collection of sufficient quantities of potent antivenin sera for each of the main genera of snakes to serve as international standards. When the extensive studies of the methods of assay used by antivenin producing institutes all over the world and of the suitability of various preparations have been completed this international programme is expected to yield the same measure of

<sup>1</sup> An account of recent work in this field by the Expert Committee will be found in the Report which is now in process of publication.

success as has the standardization of anti toxins

While proceeding with these complicated undertakings the Committee marked another aspect which portends the future of biological standardization namely the fact that progress in this field will eventually make the international biological standards superfluous. It decided that twelve international standard preparations most of which had been established prior to the last war had ceased to be international biological standards because the active principles in these preparations could now be recognized as pure chemical substances for which biological standards were no longer needed. The preparations in question include the vitamins A B C and E, oestrone androsterone progesterone and chloramphenicol. The remaining stocks of the international standards for these substances have been offered for possible inclusion on the advice of the Expert Committee on the International Pharmacopoeia in the Collection of Authentic Chemical Substances which will be established at Stockholm under the auspices of WHO.

### Controlling drug addiction in Japan

The pernicious effects resulting from misuse of "wake amine" in Japan were examined in an article published in a recent issue of the *Chronicle*<sup>1</sup>. Since then a further report on the question has been submitted to the WHO Expert Committee on Addiction Producing Drugs. This traces the development of the wake amine problem in Japan during the year 1955. The statistics which form part of Dr T. Masaki's report reveal that the total number of offenders arrested during the year diminished (55 664 persons in 1954 as against 37 143 in 1955) and that the percentage of addicts among the offenders showed a gradual decrease. Also of interest was the fact that the number of Japanese adolescents using this drug had shown a sharp fall. Dr Masaki concluded his notes by putting forward the view that whereas the misuse of wake amine had formerly been

spread throughout the whole community it now seemed to be generally confined to certain groups such as prostitutes and hooligans.

At its meeting held in Geneva between 18 and 24 October 1956 the Expert Committee on Addiction Producing Drugs took note of Dr Masaki's report. Although the situation remained serious in Japan it was also evident that through effective enforcement of control measures in the year 1955 improvements had resulted in the general situation.

### Three WHO Member States resume active participation

The People's Republics of Albania, Bulgaria and Poland have informed Dr M. G. Candau, WHO Director General, of the decision of their respective governments to resume active participation in the World Health Organization as from 1 January 1957. Albania ceased active membership in February 1950, Bulgaria in November 1949 and Poland in August 1950.

The decisions follow a resolution adopted last May by the Ninth World Health Assembly designed to facilitate the resumption by the nine inactive Members of the Organization of their rights and obligations in WHO and the settlement of arrears of contributions of those Members.

### Non-Governmental Organizations

Three non-governmental organizations were admitted into official relationship with WHO during the Nineteenth Session of the Executive Board<sup>1</sup>.

The organizations are the International Diabetes Federation, the International Confederation of Midwives and the World Federation of Societies of Anaesthesiologists.

The first of these—the International Diabetes Federation—was founded in 1950 on the initiative of the co-discoverer of insulin, Dr C. H. Best of Canada. The stated

<sup>1</sup> It brings the total number of non-governmental organizations in official relation with WHO to 3. For details of the framework of relations between WHO and the non-governmental organizations see *Chronicle* 11 11 4 Org. 19 6 10 10.

objectives of the Federation are to further the acquisition and dissemination of useful and accurate information regarding diabetes mellitus and to undertake such activities as will improve the physical and socio economic welfare of persons afflicted with the disorder. Membership of the organization consists of 21 national diabetes associations from a like number of countries. As part of its work programme the Federation is interested in holding post graduate courses for young doctors and in taking a census of diabetics throughout the world, two activities in which WHO may co operate.

The International Confederation of Midwives groups together 27 affiliated national groups and associations of midwives in 23 different countries. Total membership of these groups and associations comes to just under 112 000. Among the primary purposes of the Confederation are the furtherance of knowledge and good understanding of all problems relating to reproduction and child birth and assisting national groups to work together for the purposes of promoting family health, improving the standard of maternity care and advancing the training and professional status of midwives.

Of specific interest with reference to WHO's work is the Confederation's expressed desire to advance the standard of public health particularly in regard to maternity and child care through greater co operation between midwives and nurse midwives throughout the world.

The World Federation of Societies of Anaesthesiologists is a comparatively new body having been established in 1955. The 30 founder member societies each from a different country have over 4000 members. The Federation's object is to make available the highest standards of anaesthesia to all peoples throughout the world. More particularly it wishes to assist and encourage the formation of national societies of anaesthesiologists and to recommend desirable standards of training for them. Other functions include the provision of information regarding opportunities for post graduate training and research and the encouragement

of research into all aspects of anaesthesiology. The purposes of the Federation particularly those concerned with the provision of educational facilities and raising standards of knowledge and practice with a view to reducing the serious anaesthetic mortality in many countries are closely allied to those of WHO in this field.

#### New Assistant Director General of WHO

Dr P. M. Kaul formerly Director of WHO's Division of External Relations and Technical Assistance has been appointed Assistant Director General in charge of the Department of Advisory Services. Dr Kaul replaces Dr Victor Sutter who left the World Health Organization in order to accept an appointment as Minister of Public Health and Social Assistance in his own country, El Salvador.

Dr Kaul was born in India in 1906. He took the degree of MBBS at the King Edward Medical College, Lahore. In London he obtained the Diploma in Public Health from the Royal Institute of Public Health and became a Member of the Royal College of Physicians, London, after a period of post graduate study at Guy's Hospital and Medical School and King's College (London).

From 1934 to 1945 Dr Kaul served in the Indian Medical Service, latterly with the rank of Acting Colonel. Afterwards he became Additional Deputy Public Health Commissioner with the Government of India and remained in this post until he joined WHO's Singapore Epidemiological Intelligence Station as Medical Officer in 1948.

For some years Dr Kaul served as Director of the WHO Liaison Office with the United Nations in New York before returning to Geneva Headquarters.

#### Pan American Sanitary Bureau appointment

The appointment of Dr Myron E. Wegman of the USA as Secretary General of the Pan American Sanitary Bureau (Regional Office of the World Health Organization) has

recently been announced by Dr Fred L. Soper Director of the Bureau

In accordance with constitutional requirements the appointment received the prior approval of the Organization's seven member Executive Committee which represents the twenty one American Republics Members of the Pan American Sanitary Organization. The Committee includes representatives of Bolivia Colombia Cuba Guatemala Nicaragua Paraguay and Peru

In the position of Secretary General Dr Wegman will be the Bureau's chief planning officer responsible for co ordinating the programme planning of the Organization in the light of the health needs of the member countries. Since 1952 Dr Wegman has been Chief of the Bureau's Division of Education and Training working with medical schools public health schools and other educational institutions a post which has brought him into close association with all the governments and public health administrations in the Americas. He has recently conducted seminars on preventive medicine in which all medical schools in Latin America participated and is now completing a comprehensive survey of paediatric education throughout the Continent

Dr Wegman is a graduate of the College of the City of New York. He took his medical degree at Yale University and his public health degree at Johns Hopkins. Subsequently he was on the staff of the Maryland and New York City Health Departments. Before going to Louisiana State University Dr Wegman was successively a member of the faculty at the medical schools of Yale University Johns Hopkins University the School of Tropical Medicine in Puerto Rico Cornell and Columbia Universities

#### **Death of Professor Charles-Edward Amory Winslow**

On 8 January 1957 the death occurred at his home in New Haven Connecticut of Professor Winslow a great supporter of international collaboration in the health field. His death will be deeply regretted by many public health workers as well as by his

friends students and colleagues throughout the world

Professor Winslow was long connected with the work of international organizations. In 1921 he served as General Medical Director of the League of Red Cross Societies in Geneva between 1927 and 1930 as Expert Assessor Health Committee of the League of Nations and in 1951 as a consultant to the World Health Organization. During this latter period Professor Winslow prepared at the request of WHO the well known monograph *The Cost of Sickness and the Price of Health*. In 1952 he was awarded the Leon Bernard Medal by the Fifth World Health Assembly. This award took its place alongside the Sedgwick Memorial Medal the W Paul Anderson Medal and the Lasker and Prentiss Awards.

Born on 4 February 1877 in the United States of America Professor Winslow took a B.S. from the Massachusetts Institute of Technology. He commenced his work in public health in 1898 when he became an Assistant Health Officer in Montclair New Jersey. In later years Professor Winslow held many important public health posts in the USA. Among the more prominent were Curator of Public Health at the American Museum of Natural History New York Professor (and subsequently Professor Emeritus) at the Yale University Medical School and Chairman of the New York State Commission on Ventilation.

#### Executive Board session

Some 60 agenda items were dealt with by the WHO Executive Board in the course of its nineteenth session which took place in Geneva between 15 and 30 January. The session was presided over by Professor G. A. Canaperia with Dr R. Pharaon as Vice Chairman. In the absence of the other Vice Chairman Dr C. K. Lakshmanan his alternate Dr T. C. Puri was nominated Acting Vice Chairman. The Board elected Dr E. Suarez and Dr B. M. Clark as Rapporteurs.

Among the more important decisions reached by the Board were

#### *Programme and Budget Estimates for 1958*

The Board considered that the Director General's programme was well conceived within the scope of the Organization's long range functions and objectives although there might be a re-assessment of the activities in terms of urgent priorities. It recommended that the Tenth World Health Assembly approve a basic effective working budget of \$11 761 350 and a supplemental budget for an amount not to exceed \$1 871 000.

#### *Appointment of Regional Directors*

The Board appointed Dr Paul J. J. van de Calseyde as Regional Director for Europe from 1 February 1957 and Dr Abdol Hossein Taba as Regional Director for the Eastern Mediterranean from 1 September 1957. Before making this latter appointment the Board paid tribute to Dr Ali Tewfik Shousha the present Eastern Mediterranean Regional Director who has been associated with the work of WHO since the early days of the Interim Commission and has held office as Regional Director for the past eight years. He will be retiring at the end of August. Dr Shousha was Chairman of the first three sessions of the Executive Board in 1948-49.

The new European Regional Director Dr van de Calseyde was born in Ghent in 1903 and obtained his medical degrees at the University of Ghent in 1929. In 1930 he was appointed Medical Officer of Health at the Ministry of Postal Services and Transport and in 1935 he entered the Ministry of Health. He was appointed Director General of Public Health in 1945. Dr van de Calseyde is also a member of the WHO Expert Advisory Panel on Venereal Infections and Treponematoses and has represented Belgium for many years at the World Health Assembly and on the Regional Committee for Europe.

Dr A. H. Taba who will be taking over as Eastern Mediterranean Regional Director on 1 September 1957 and who is at present Deputy Director of the Regional Office was born in 1912 in Teheran and studied medicine at the Universities of Birmingham and

London He was Surgeon-in-charge of the Iranian Railways Health Department a member of the Iranian Parliament of the Supreme Health Council in Teheran and of the Central Committee of the Imperial Health Organization of Iran Dr Taba represented his country at the Third World Health Assembly

#### *Peaceful uses of atomic energy*

WHO's collaboration with the United Nations and other organizations and agencies concerned with the peaceful uses of atomic energy will be carried a stage further by reason of the Board's decision to authorize the Director General to initiate discussions with the Preparatory Commission of the International Atomic Energy Agency with a view to concluding an agreement between the two Organizations on the basis of the agreements entered into between WHO and the specialized agencies

#### *Eleventh World Health Assembly*

A recommendation was made by the Board to the Tenth Health Assembly that the Eleventh World Health Assembly should be held in the United States of America provided that an invitation was received from that country by the time of the forthcoming Health Assembly

Action was also taken by the Board on the question of a special ceremony to mark the tenth anniversary of the Organization It was decided to recommend that the ceremony should take the form of a two day special session which should be held in the same place as and immediately preceding the Eleventh World Health Assembly

The Board noted with appreciation the Darling Foundation Committee's decision that the medal and prize for the fifth award should be presented to Dr P F Russell and requested the Director General to arrange for this presentation by the President of the Tenth World Health Assembly

#### *Expert Committee Reports*

The Board authorized the publication of ten WHO Expert Committee reports They will be issued later in the WHO *Technical Report Series* Reports to be published are Joint FAO/WHO Expert Committee on Food Additives (First Report) Joint FAO/WHO Expert Committee on Milk Hygiene (First Report) Expert Committee on Rabies (Third Report) Expert Committee on Insecticides (Seventh Report) Expert Committee on Rheumatic Diseases (Second Report) Expert Committee on Organization of Medical Care (First Report) Expert Committee on Malaria (Sixth Report) Expert Committee on Health Laboratory Methods (First Report) Expert Committee on Addiction Producing Drugs (Seventh Report) Expert Committee on Biological Standardization (Tenth Report)

#### *Future work*

In one of the Board's final meetings decisions were taken to appoint representatives of the Board at the Tenth World Health Assembly and arrangements were made for the Board's next meeting Professor G A Canaperia and Mr W H Boucher were appointed to represent the Board at the forthcoming Assembly It was agreed that the twentieth session of the Board would commence in Geneva on Monday 27 May

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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## Review of WHO Publications

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**Meat Hygiene** By various authors Geneva 1957 (*World Health Organization Monograph Series* No 33) 527 pages 106 illustrations 2 colour plates bibliography index  
Price £2 10s \$10 00 Sw fr 30 —

This comprehensive and well illustrated book contains contributions from meat hygiene experts in many parts of the world. It is not intended as a universal guide to meat hygiene: its aim is to throw light on recent advances and problems in the many and diverse aspects of this vast subject for the benefit of the responsible authorities and students in public health and veterinary science. The table of contents is as follows: The epidemiology of meat borne diseases (*C E Dohman*) Transport ante mortem care and inspection of animals intended for slaughter (*M J J Houthuis*) Hygienic construction and technical organization of slaughterhouses (*G Scaccia Scarafoni*) Methods of stunning slaughter and collection of blood (*T Blom*) Electrical stunning (*Phyllis G Croft*) the municipal abattoir (*R Benoit*) General principles for post

mortem inspection and hygienic judgement of meat (*H Thornton*) Post mortem inspection and judgement of tuberculous carcasses (*H Drieux*) Post mortem inspection and judgement of parasite infected carcasses (*G Schmid*) Application of bacteriological and biochemical tests in the hygienic judgement of meat and meat products (*A Jepsen*) Hygienic aspects of meat processing (*F Schonberg*) Disposal and reclamation of by products (*V E Albertsen*) Hygienic control of meat in markets and in food serving establishments (*S O Koch*) Training of meat inspectors (*H Thornton*) Survey of meat hygiene practices in Europe (*R I Hood & H H Johansen*) Meat hygiene problems in tropical areas (*M M Kaplan*) In addition to a select bibliography sixteen annexes are included. These cover such subjects as annual meat consumption in various countries, the transport of slaughter animals by road, rail, sea and air, the design of abattoirs, bacterial food poisoning and its investigation, meat inspection regulations and the findings of a WHO/FAO seminar on meat hygiene which was held in Copenhagen in 1954.

### Influenza

"According to reports received up to 14 February, no evidence on any important influenza epidemic has been observed in Europe or in North America. In the United States the presence of an Influenza A virus closely related to the Ann Arbor/56 strain has been noted in connexion with a localized outbreak in an airforce base in Colorado."

from the WHO Weekly Epidemiological Record 1957 32 96

## NEW IDEAS ON THE BIOLOGY OF THE TREPONEMAL DISEASES

Until only a few years ago the treponematoses were thought to differ from all other infectious diseases since the process of immunity seemed to be subject to different biological laws.

The results of many years of research especially the investigation carried out at the International Treponematoses Laboratory Center have changed this outlook by showing that these diseases are not fundamentally different since they do in fact give rise to reactions of the same nature in the infected organism. In a monograph<sup>1</sup> recently published by WHO Professors T. B. Turner and D. H. Hollander have assembled the results of this valuable experimental work on the biological processes of the treponematoses stressing particularly the most poorly understood and sometimes most disputed aspects.

In 1950 the International Treponematoses Laboratory Center was set up in the Department of Microbiology of the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md. The work of this laboratory now forms part of WHO's programme for the co-ordination of research in treponematoses control.

Some of the subjects dealt with in the monograph are briefly reviewed in the following pages.

Syphilis and yaws have been recognized for over 400 years as distinct disease syndromes. Their relationship was suspected well before 1905 when the etiological agents *Treponema pallidum* and *T. pertenue* were discovered. Syphilis, yaws and pinta (whose relationship to the first two diseases was only recognized later) constitute perhaps the most clear-cut entities within the treponematoses

group. Allied infections which have not as yet been so extensively studied are the endemic syphilis group of diseases contracted in infancy. These diseases are known by various names—for example bejel which is found among the nomadic tribes of the hot dry regions of Asia Minor and the Eastern Mediterranean, endemic syphilis in certain parts of the Balkans, dichuchwa, in Bechuanaland and adjacent areas, njovera, in Southern Rhodesia and siti in Gambia. It is also interesting to note that naturally occurring venereal spirochaetosis of rabbits is biologically related to the human treponematoses.

Over the years research workers in the International Treponematoses Laboratory Center have isolated some 76 strains of *Treponema* (39 strains of syphilis, 20 of yaws, 3 of bejel, 8 of endemic syphilis and 6 of venereal spirochaetosis of rabbits). These strains have been compared from the clinical, serological and immunological viewpoints. While recognizing the need to exercise caution and judgement in translating the results obtained with animals into terms of the disease in man, the authors have nevertheless suggested interpretations of the experimental findings which throw light on the clinical and epidemiological problems of the human treponematoses.

### The experimental disease

The fact that it is still impossible to cultivate treponemes *in vitro* limits the scope of the experimental study of the metabolism or the antigenic structure of these microorganisms. The investigations described in this monograph were carried out with the rabbit, an animal which has long been used in experiments on this group of diseases. The authors also employed the hamster

<sup>1</sup> Turner, T. B. & Hollander, D. H. (1957) *Biology of the Treponematoses*. Gen. & Cold Spring Harbor Organization Monograph Series, No. 35. Price \$1.10n., \$6.00 or 5 £ 18.—

## SCHEDULE OF MEETINGS

- |                |  |
|----------------|--|
| 8 13 April     | Expert Committee on Yellow Fever Vaccine Geneva  |
| 25 April 3 May | Seminar on Mental Health of the Sub-Normal Child Oslo  |
| 25 April-4 May | Joint WHO/ILO Seminar on the Nurse in Industry London  |
| 7 25 May       | Tenth World Health Assembly Geneva   |
| 27 31 May      | Twentieth session of the Executive Board Geneva  |
| 12 15 June     | Sub Committee on Non Proprietary Names of the Expert Committee of the International Pharmacopoeia Geneva |
| 17 24 June     | FAO/WHO Expert Committee on Food Additives Geneva  |
| 24 28 June *   | Study Group on Histological definitions of cancer types Oslo   |
| 27 June 5 July | Conference on Health Education of the Public Wiesbaden   |
| 15 20 July     | Expert Committee on Poliomyelitis Geneva   |
| 25 31 July     | Technical Conference on Insect Resistance  |

App o m t d t

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.



The effect of temperature on treponemal lesions is clearly shown on experimentally infected rabbit. In the rabbits shown on the left, only one of the lesions was given and on the right of the body was then having—the other half of the rabbit with the positive or half on the black lesions did not appear on the part protected by fur which has a higher temperature (The rabbits were entirely shaved before the photographs taken)

reasonably be extended to visualize a substantial modification of those strains of treponemes after years and years of exposure towards a less virulent variety. Carrying this idea a step further it may be postulated that treponemes of lowered virulence likewise provide a lesser antigenic stimulus to the host. This in turn may account for poor development of the immune response with a tendency to chronicity and relapse over a period of many years.

**Hormones (cortisone)** The well known effects of cortisone such as the suppression of inflammatory tissue reactions and the stimulation of the growth of numerous bacterial species in the body were also observed in experimental syphilis. In animals which have received cortisone there is a tremendous overgrowth of treponemes in both initial and secondary foci. At the same time hyaluronic acid whose transformation appears to be inhibited by cortisone accumulates in the lesions which lose their typical firm often stony hard characteristics and become soft and spongy. Phagocytosis is inhibited by the presence of this mucoid material which also opposes at least partially the penetration of antibodies in so far as the production of the latter is not suppressed by the cortisone.

Experimental use has been made of the properties of cortisone to obtain the large numbers of treponemes that are necessary for the preparation of treponemal antigens.

**Antibiotics** Fortuitous contact with antibiotics may also have an influence on the host-parasite relationship. It is in fact, extremely difficult under present-day conditions to isolate either experimental animals or man from the effect of antibiotics. Food stuffs may contain antibiotics particularly if they include milk or meat coming from animals which have received antibiotics as part of their normal diet. It is interesting to speculate on the extent to which the treponematoses may be affected by the widespread use of antibiotics. In the authors' opinion it is not altogether fantastic to postulate that even before antibiotics were discovered some of the geographical and epidemiological peculiarities of treponemal disease may have resulted from antagonistic bacterial or fungal flora in certain areas of the world.

### Immunity

The treponematoses in particular syphilis were long considered to occupy an exceptional place among the infectious diseases. The chronicity of the disease and the

which in addition to being free from any natural treponemal disease has the advantage that after inoculation many of the treponemes may persist in the lymph nodes. Moreover it presents reactions to the disease which have not so far been seen in any other animal.

Treponemes isolated from all the main forms of treponematoses produce similar experimental lesions. A relatively small number of treponemes—perhaps even only one—can produce infection. Multiplication occurs at a regular although comparatively slow rate—in logarithmic progression after 24-48 hours—leading to the production of a mass of treponemes which cause a visible lesion. There is a linear relationship between the number of treponemes (*Nichols* strain of *T. pallidum*) and the incubation period in the rabbit. With an intradermal inoculum of 500 treponemes the incubation period is approximately 17 days. With a tenfold increase in the number of treponemes inoculated this period is shortened by about 4-5 days. A generation time of 30-33 hours for *T. pallidum* can be computed from these data.

The authors were able to establish a correlation between the development of the clinical disease in rabbits and the accompanying histopathological changes. The initial stage is characterized by the production of a mucoid material identified as hyaluronic acid. In a second stage there is an infiltration of mononuclear leukocytes followed in a third stage by an influx of polynuclear cells probably as a reaction to necrosis or to secondary infection in the lesion.

It was found possible to divide the strains of treponemes into three categories according to the lesions observed in the rabbit and in the hamster and certain immunological patterns in the former animal.

The S type includes most of the strains isolated from patients suffering from venereal syphilis and in rabbits it causes indurated lesions at the site of inoculation. The Y type comprises most of the yaws strains and causes only minimal changes at the site of inoculation in rabbits. The M type includes most

of the strains isolated from cases of the endemic syphilis group of diseases and in rabbits it causes reactions intermediate between the S type and Y type reactions. Other differences in response between organisms of the three types are found at the sites of inoculation in hamsters. No serological differences have been discovered between these types which evidently have common antigens.

#### Influence of various factors on experimental infection

The more or less precarious balance between the parasite and host may be influenced by various factors among which the authors studied more particularly temperature, hormones and antibiotics.

**Temperature.** It appears that 35°C is the temperature most favourable to the development of treponemes. Temperatures even only slightly higher are unfavourable and at 40°C the treponemes are gradually destroyed. At temperatures below 30°C they multiply slowly if at all. The influence of temperature seems to be very important and may even be considered decisive in the localization of treponemal lesions. Thus in the rabbit whose internal body temperature is normally about 39°C lesions of the internal organs are rare. On the other hand the ears, skin, testes and extremities whose temperature is lower are the preferential sites of either primary or metastatic lesions. The fundamental role of temperature in this group of diseases is commented on by the authors as follows:

One can only speculate concerning the effects of long continued environmental temperature on the treponematoses in human beings. It can be deduced from these studies on the experimental disease that consistently high environmental temperatures such as are met with in the tropics which in turn account for slight but definitely higher skin temperatures may have a slightly adverse effect on treponemes infecting individuals inhabiting the areas concerned and this thesis can

conditions the treponemes are phagocytized and that this process is inhibited, at least partially by the accumulation of mucoid substances in animals treated with cortisone

#### Future research

Although it is true that the results given in the monograph have elucidated many problems in the field of the experimental treponematoses nevertheless there are various subjects calling for more thorough study and new lines of investigation awaiting exploration. In this connexion the authors suggest that research should be carried out on

(a) the adaptive and mutational patterns of the pathogenic treponemes (during animal

passages certain strains have shown a variability whose nature and characteristics call for investigation)

(b) the immunochemistry of pathogenic treponemes with particular reference to the identification of serologically active antigenic components both in the body of the treponeme and in the capsular material with a view to finding improved methods for demonstrating group or species specific antibody

(c) the nature of Wassermann antibody (reactin) the mechanism of its production and its role in treponemal and other chronic disease processes

(d) methods of cultivating treponemes in vitro

## LEPROSY IN THE AMERICAS

Modern public health workers in many parts of the world are no longer regularly in contact with leprosy and the disease tends to be regarded too often as a relic of the past. However a recent analysis of the distribution and number of leprosy cases throughout the Americas has revealed the disturbing fact that far from being reduced to a minimal level this disease is still an important public health problem despite the effectiveness of new treatment methods with the sulfones. A report entitled *The problem of leprosy in the Americas* was presented for discussion to the last meeting of the Directing Council of the Pan American Sanitary Organization which acts as the WHO Regional Committee for the Americas in September 1956 in Antigua Guatemala. It is evident from the report that although new developments in treatment of leprosy and particularly the therapeutic methods have resulted in overcoming fear and bringing more patients to the physician this could not be said to supply

the complete answer for the problem of leprosy as indicated in the statistics compiled. Indeed as the report observes "In the Americas there are a number of foci of the disease and although generally speaking the prevalence rates are not as high as in some parts of Africa or Asia, forceful measures are required to solve the problem in this Hemisphere." But—the report points out—

Before any systematic program for the control of leprosy can be planned in the Americas at either the national or the international level more precise knowledge must be gained of the extent and epidemiological characteristics of the problem. Many countries have yet to undertake leprosy censuses and in others such censuses have been only partial or incomplete."

In the table appended will be found a summary of the information collated by PASB/WHO on the prevalence of leprosy in the Americas and the existing facilities for its treatment and control. These statistics are as up to date as possible but it should be borne in mind that certain countries

impossibility of detecting the presence of antibodies in man or infected animals led to the supposition that resistance was closely linked to the presence of treponemes and that cure brought about the disappearance of resistance

The work of the International Treponematoses Laboratory Center following that of Chesney has shaken these ideas by showing that immunity phenomena in the treponematoses are similar to those in other diseases and that in the rabbit immunity when once established persists long after the elimination of the infecting organism. The treponemes induce the production of specific antibodies human or animal syphilitic serum when added in vitro to virulent treponemes prevents the development of the disease in inoculated animals. These fundamental experiments carried out in this laboratory were the origin of the treponemal immobilization test (TPI test) which detects an antibody differing from the so called Wassermann antibody (reagin). In most cases of treponemal infection in fact the two antibodies coexist. The presence of antibody immobilizing treponemes indicates present or past treponemal infection. This antibody plays an important role although not an exclusive one in the immune process. The TPI test has been of great help to serologists in the diagnosis of syphilis and in the detection of biologically false positive reactions and has many possible applications in other fields of pathology.<sup>2</sup> However the technique is still too complicated for the test to be generally used. An attempt is being made to simplify it and to develop other tests based on agglutination and adhesion phenomena

### Response to chemotherapy

None of the more recently discovered antibiotics is as effective against treponemes as penicillin. Nevertheless some of them—for example Magnamycin—have a definite therapeutic action. When penicillin and Magnamycin are used together they

appear to exhibit an additive effect. As regards Aureomycin (chlortetracycline) and Terramycin (oxytetracycline) doses 100 times larger than that of penicillin are necessary to obtain the same results. Nevertheless it is important to determine the therapeutic activity of antibiotics other than penicillin since it is always possible that their use may become necessary if some strains of treponemes develop resistance to penicillin. This is an eventuality which cannot be absolutely excluded although penicillin has been in use for 10 years without such resistance making its appearance. Furthermore an increasing number of patients are becoming hypersensitive to penicillin and some attempt at avoiding the consequences of this may become necessary.

The antibiotic role which fungi and bacteria may have played in the evolution of the treponematoses in certain parts of the world during the course of the centuries has already been mentioned. In the same connexion it is possible that the widespread employment of antibiotics for the treatment of non treponemal complaints, their use to stimulate animal growth and their presence in foods derived from such animals may have long term repercussions on the epidemiology and even the clinical features of the treponematoses. The authors express the opinion that

in view of the wide range of antibiotics that have some bactericidal or at least some inhibitory effect on treponemal infections it is probable that these diseases in man are continuously being subjected to minor therapeutic effects. What role this may play in their control or modification is difficult to assess.

It has not been possible to determine the actual principle of the action of penicillin on the treponemes. It would seem that the antibiotic exerts a lethal effect on them without bringing about lysis. It is true that in man a considerable fall in the number of treponemes is observed following penicillin treatment. Nevertheless in animals treated with cortisone the treponemes are immobilized by penicillin perhaps even killed but not lysed. It may be supposed that under normal

indicated that leprosy demands a higher priority under national public health programmes in countries on the American continent, if it is to be successfully brought under control. Many interesting facts regarding recent national antileprosy work were brought before members of the PASO in the course of the Antigua meeting. The representative of France drew attention to the fact that since the systematic search for leprosy cases was begun in French Guiana, Martinique and Guadeloupe the known number jumped from approximately 250 to nearly 2000 in the course of six years. This did not imply a leprosy epidemic but rather that a greater number of cases—many of them in the younger age groups—had become known where treatment could be more effective. In the leprosarium at Fort-de-France nearly 50% of the patients were under 20 years old and more than 25% under 14. Outlining the modern antileprosy measures carried out in the French Antilles the representative of France said that sanatoria had been established for treatment of leprosy cases during the infectious stage. While the patients were in the sanatoria they were taught how to treat themselves after departure. Another phase was dispensary treatment for those who did not require hospital treatment, or for those who had left hospital and were able to live with their families.

In Brazil leprosy constitutes a very important problem and as was pointed out by the representative of Brazil the techniques used to date for leprosy control had not produced the results expected. This despite the fact that there were 36 leprosaria, 31 preventoria, and 80 regional dispensaries in operation. The Brazilian National Leprosy Service was revising its operating methods in keeping with new developments.

#### Use of BCG in leprosy control

Possibilities inherent in the use of BCG vaccination for leprosy control were touched on by the delegate of Venezuela. It will be recalled in this connexion that the Expert

Committee on Leprosy in its first report<sup>2</sup> was unable to endorse fully the use of BCG vaccination and confined itself to the following comment: "Though there is indirect evidence of the protective value of BCG against leprosy the Committee could not justifiably recommend it officially as a control measure until adequate large scale trials had been conducted." However as the representative of Venezuela remarked BCG vaccination had been applied in leprosy areas of Venezuela for many years. There were two distinct types of programme: (a) vaccination of the entire population in leprosy areas and (b) vaccination of the population under 15 in leprosy foci for four consecutive years. Under these two different types of programme between 200 000 and 250 000 people were being vaccinated annually in Venezuela. This experiment would be of use in arriving at a conclusion on the usefulness of BCG as an antileprosy agent.

#### Importance of new approach

In drawing attention to the fact that treatment of leprosy cases in dispensaries in the British West Indies has now become increasingly common the representative of the United Kingdom pointed out that the old inflexible laws on leprosy were in the process of being changed and a new approach was being adopted towards the disease from both medical and social viewpoints. One of the important steps in changing public attitude towards leprosy was the revision of legislation which maintained the out-dated concept of the disease.

The representative of Colombia underlined the fact that the leprosy problem in the Americas was much more important than had been believed formerly. This fact was evident in the large number of cases revealed by recent statistics and the large sums of money being spent in antileprosy campaigns. In Colombia 20% of the public health budget was used for the care of 12 000-15 000 leprosy patients, 6000 of whom were in leprosaria.

In conclusion the Directing Council of the



have developed and improved leprosy control services since the information was collected

During the discussion of the report great interest was expressed in the change of attitude to leprosy which had taken place in public health services throughout the world. Stress was laid on the new concepts and practices being recommended by leprologists especially the possibility of early active

drug treatment and rehabilitation and selective isolation so that patients can be returned in a non infectious state to active life

### Modern antileprosy measures

That a demonstrable need exists for more active measures in combating leprosy there can be little doubt. Recent experience has

## PREVALENCE OF LEPROSY AND EXISTING FACILITIES FOR ITS TREATMENT AND CONTROL IN THE AMERICAS

Countries	Estimated population for mid year 1953	Leprosy cases			Leprosaria and colonies		Dispensaries	Date of information
		total known	segregated	total estimated	number	capacity		
Argentina	18 379 000	8 975		16 000	5	2 785	4	1954
Bolivia	3 127 603	610	35	1 400	2		3	1954
Brazil	5 211 268	60 967	22 954		38	24 000	93	1950
Canada	14 756 000 <sup>b</sup>	16	10	17				1952
Chile	6 074 981	37	13	37	1	40		1954
Colombia	12 107 810	9 155	6 507	12 000	2		11	1950 and 1956
Costa Rica	881 313	211	164		1	100	1	1950
Cuba	5 394 326	3 623	736	6 000	2		10	1952
Dominican Republic	2 290 805	268	188					1950
Ecuador	3 439 020 <sup>d</sup>	150			2		1	1955
El Salvador	1 929 779	6						1953
Honduras	1 555 664	40	5		—	—	—	1955
Mexico	28 052 513	11 378		50 000	1		19	1953
Paraguay	1 504 246	979	334	10 000	1		1	1954
Peru	8 591 300	1 127		3 400	3	50	7	1951
United States	158 306 000		400	12 000	6			1955
Uruguay	2 523 000 <sup>d</sup>		62	500 1 000	—			1954
Venezuela	5 377 508	8 648	866				171	1956

No date obtained for Guatemala Haiti Jamaica Nicaragua and Panama

— None

No Information

<sup>a</sup> Revised report

<sup>b</sup> Excluding the Yukon and the Northwest Territories. Population as of 1 June

Estimated population for mid 1952

<sup>d</sup> Estimated by PASB

There are no leprosy cases in continental Chile. These are found on Easter Island (population 800)

<sup>f</sup> Plus 5 transit hospitals and 1 preventorium

<sup>x</sup> Plus 29 preventoria

<sup>k</sup> These are in fact lazarets having a mixed population of patients and healthy persons

<sup>l</sup> The Tegucigalpa Hospital has 8 beds for leprosy patients

<sup>j</sup> Plus 4 special wards in general hospitals with 105 beds. There are also 3 private clinics

<sup>k</sup> Plus 1 preventorium for healthy children of leprosy patients

<sup>l</sup> Patients are interned in a general hospital

indicated that leprosy demands a higher priority under national public health programmes in countries on the American continent, if it is to be successfully brought under control. Many interesting facts regarding recent national antileprosy work were brought before members of the PASO in the course of the Antigua meeting. The representative of France drew attention to the fact that since the systematic search for leprosy cases was begun in French Guiana, Martinique and Guadeloupe the known number jumped from approximately 250 to nearly 2000 in the course of six years. This did not imply a leprosy epidemic but rather that a greater number of cases—many of them in the younger age groups—had become known where treatment could be more effective. In the leprosarium at Fort-de-France nearly 50% of the patients were under 20 years old and more than 25% under 14. Outlining the modern antileprosy measures carried out in the French Antilles the representative of France said that sanatoria had been established for treatment of leprosy cases during the infectious stage. While the patients were in the sanatoria they were taught how to treat themselves after departure. Another phase was dispensary treatment for those who did not require hospital treatment or for those who had left hospital and were able to live with their families.

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In conclusion the Directing Council of the

Pan American Sanitary Organization noted the increasing importance of leprosy in the Americas and recommended that national programmes against the disease should be revised in the light of modern knowledge

The Director of PASB was requested to continue studies of the extent of the problem to facilitate the training of personnel for national leprosy services and to promote technical discussions

## CENTRES FOR STUDIES ON ENTERIC BACTERIA

The identification and classification of the micro organisms causing enteric fevers has for half a century been a subject of controversy among bacteriologists. Few groups of bacteria have given rise to so much research work as the salmonellae the escherichiae and the shigellae the causative agents respectively of typhoid and paratyphoid fevers severe forms of infantile diarrhoea and bacillary dysentery

The wide range of their antigenic and enzymatic properties has necessitated the use of serological and biochemical methods of classification which during the last fifty years have been constantly improved and refined. In addition identification techniques have been developed based on interactions with specific bacteriophage strains

The efforts made to find a satisfactory basis for the classification of these micro organisms have not had a purely scientific aim or been merely of academic value. These pathogens are found all over the world and they still give rise to public health problems in many countries despite improved standards of hygiene and sanitation which impede their propagation

Thus in Japan nearly 83 000 cases (with nearly 5000 deaths) of bacillary dysentery were notified in 1956 (51 weeks) and more than 2000 cases of typhoid fever in Iran in 1955 there were more than 5000 cases of typhoid and paratyphoid in Iraq in the same year there were more than 1400 cases of typhoid and more than 1300 cases of bacillary dysentery. In Turkey during the first 11 months of 1956 the number of notified cases exceeded 5000 and in Italy in 1955

more than 19 000 cases of typhoid and nearly 5000 of paratyphoid were reported. In Greece during the same year there were some 4600 cases of typhoid and paratyphoid in Portugal some 3000 cases in France about 4500 and in Yugoslavia about 4000

Typhoid fever has a tendency to regress in countries where hygiene standards have improved and the population has clean water at its disposal. Nevertheless in predominately rural areas both in temperate climes and in the tropics typhoid fever prevalence remains high and judging from available mortality data it is more serious as a public health problem than the paratyphoid fevers notwithstanding the numerically greater importance of the latter in many countries<sup>1</sup>

### International centres for studies on enteric bacteria

Because of WHO's concern with the distribution and incidence of these diseases the Organization agreed at the suggestion of the International Association of Microbiological Societies (IAMS) to sponsor and develop on a world wide scale the activities of three centres specializing in the identification and classification of enteric bacteria

In 1948 WHO assumed a supervisory responsibility for the International Salmonella Centre which had been in operation at the Statensserum Institut Copenhagen since 1938. In 1950 the Centre was extended to cover the study of another group of

bacteria, namely the escherichia. The two other centres concerned especially with the study of the shigellae one of which is in London England and the other in Atlanta Ga USA were established as international centres with the support of WHO in 1954

The basic aim of these international centres is to promote uniform classification and terminology throughout the world for the salmonellae escherichiae and shigellae. It is not their task to lay down rules of nomenclature which is the responsibility of special committees of the IAMS but to collect identify maintain and distribute cultures of these bacteria and to prepare and distribute diagnostic antisera, by means of which the antigenic type of the bacteria under study can be determined. This work of identification and classification establishes foundations for the epidemiological study of the diseases caused by these micro organisms. It is not the immediate task of the international centres to study epidemics themselves. They supply reliable and uniform bacteriological data and materials which will be of help to the public health specialists of the various countries in the laboratory work necessary to operate effective control methods.

#### Collaboration with the national centres

The work of the international centres calls for close liaison with other laboratories throughout the world in particular those which act as the main enteric diagnostic laboratories within their own countries i.e. the national centres. An example will help to clarify the relationships established between the international and the national centres. If an outbreak of dysentery or food poisoning occurs the micro-organism responsible will be isolated at the national centre for the study of enteric bacteria and will be identified with a degree of accuracy varying according to the particular case. This work will be facilitated by one of the international centres which will send the national centre reference sera or specific bacterial strains as well as technical advice.

In difficult cases the international centre may be called upon to assist in the exact classification of the micro-organism. On the other hand the national centre should investigate the epidemiological aspects of the outbreak its gravity extent causes etc. In the field of bacteriological identification moreover the responsibility of the national centre is an important one as if the national centres themselves did not do most of this work but merely referred much of it to the international centres the load thrown on the latter would be far too great.

#### WHO suggests designation of national centres

However a more extensive network of co-operating national centres in the study of the enteric bacteria and the epidemics they cause is now needed. Consequently WHO recently sent a letter to Member States describing the services which the international centres can render to the national health administrations and the relationship it is desirable to develop between them. The letter also contained suggestions to governments wishing to improve designate or set up national centres for the study of the salmonellae escherichiae and shigellae. Clearly the activities of these centres represent only one aspect of the campaign which the health authorities must carry on against the diseases caused by these micro-organisms. These efforts include adequate sanitation measures and an improvement in general living conditions.

#### Training of qualified personnel

Relations between international and national centres can only be fruitful when the latter have a staff of experienced bacteriologists specialized in this type of investigation. This is an essential condition for the creation of a national laboratory. If the staff at the national level is not sufficiently qualified then there is a risk that the international centre will be swamped with requests for work which would normally come within

the scope of the national centres. However microbiologists specialized in this field are available in sufficient numbers in some countries only and suggestions have therefore been made for visits by experts from experienced laboratories to give advice where required and for specialized training of microbiologists in international centres.

As pointed out in the letter in each of the international centres bacteriologists have the possibility of familiarizing themselves with biochemical and serological techniques for the identification of the enteric bacteria. At Atlanta a 10-12 days course dealing with the laboratory diagnosis of the enteric

group of infections is given annually for about 20 participants and a more advanced course is organized for a minimum of two weeks for a smaller number of bacteriologists. At Copenhagen and London individual training is given arrangements being made for each particular case. The WHO fellowships programme also makes a useful contribution towards the wider exploitation of these facilities for professional training.

In these ways WHO is endeavouring to establish the basis for a more effective control of enteric diseases by developing and active network of laboratories of high scientific standard.

## PUBLIC HEALTH PROGRESS IN AFGHANISTAN\*

Despite the innumerable difficulties which its geographical situation gives rise to Afghanistan is making a courageous effort in public health. Only a few decades ago no beginning had yet been made. Epidemics of typhus, cholera and smallpox ravaged the country, malaria, tuberculosis and nutritional deficiencies took a heavy toll in deaths, the death rate among young badly fed infants was enormous, there were no doctors, nurses or sanitary technicians. The Government realized that the first necessity was to provide the country with suitable health facilities. Foreign physicians were called in and the King Nadir Shah founded the Faculty of Medicine which was directed first of all by Turkish and then by French professors. Today professors are recruited from a number of countries by agreements between governments or sent by WHO. Several Afghan lecturers now also hold Chairs. So far the number of students enrolled each year does not exceed 130-150. Schools for male and female nurses are training medical auxiliaries.

Kabul has two large modern and well arranged hospitals and a sanatorium; these establishments function as satisfactorily as the difficulties of obtaining equipment and drugs allow. Large hydro electric plants are being built and when they are completed the problems consequent upon an uncertain electric current will disappear.

Provincial hospitals have also been constructed but they are still short of staff and equipment. A very modern hospital for women was recently opened at Kandahar with WHO assistance; it provides outpatient, maternal and child health, prenatal and milk distribution services. Provision has also been made for setting up mobile units for emergency treatment among the nomadic tribes in regions where lack of communications makes access difficult.

In addition to the Faculty of Medicine Kabul also has a number of specialized institutions which were created under the aegis of WHO. A public health laboratory carries out routine biological examinations and trains laboratory technicians. A malaria institute and a tuberculosis institute supplement the efforts of the technical advisers and public health specialists and at the same

time train Afghans for key posts. In short a well planned organization has been established and is gradually growing. As will be seen it already has some notable achievements to its credit.

### Malaria control

Up to 1950 malaria was rife in the whole of the Kunduz region between the Hindu Kush and the Amu Darya. Each year the thaw caused vast floods and created innumerable anopheline breeding places with the result that at least 25% of the inhabitants were affected by malaria and typhoid fever and so were prevented from harvesting the crops in this fertile region normally. Economically this represented an annual loss of \$20 000 000. The sanitation work which was later carried out cost the State about \$15 000 but the results were spectacular. The Kunduz region is now one of the richest agricultural areas in the country.

However Afghanistan could not on its own extend this operation to the whole of the country and it was therefore with the aid of WHO that a large scale mosquito control campaign was launched in the region of Kabul which was particularly hard hit by malaria. The most up-to-date methods were employed and except in a few outlying spots where sanitation measures still have not reached malaria has now practically disappeared from the region. The campaign is being gradually extended to the rest of the country and there is reason to hope that in a few years the disease will have been eliminated.

### Louse-borne typhus

Not very long ago louse borne typhus was a country wide pestilence. Hard winters overcrowding in barely heated mud houses under nourishment and poverty caused frequent and devastating epidemics. The epidemic at Kandahar in the winter of 1951 for example caused 1000 deaths in a month. However since the introduction of systematic DDT dusting in the army, the police force and in schools, mosques and public vehicles

of disinsectization of dwellings by special teams and of anti rickettsiosis vaccination there have been no epidemics. The few isolated cases notified have been treated by the Kabul or provincial hospitals.

### Smallpox cholera tetanus and rabies

Vaccination against smallpox cholera and tetanus is becoming increasingly common at least in Kabul and the larger towns—for it is still difficult to reach the nomadic tribes. A marked regression of smallpox has been noted.

The Kabul Institute of Hygiene now produces enough smallpox vaccine to meet the country's needs and also gives anti rabies treatment to persons bitten by stray dogs or by the wolves which in the very cold Afghan winter penetrate as far as the capital.

### Tuberculosis

Tuberculosis is another serious problem in the country. Nevertheless an auspicious start has been made towards its solution by tuberculin testing in Kabul schools by systematic case finding by the Tuberculosis Institute (set up with assistance from WHO) and by a BCG vaccination campaign. Unfortunately however the Kabul sanatorium is at present too small to accommodate and treat all the confirmed cases of tuberculosis in the country. The problem is certainly serious but the results obtained so far augur well for the future.

### Infant health

According to WHO statistics about 50% of Afghan children died in 1950 before reaching the age of two. This situation is due to a general ignorance of the elementary principles of child welfare and to the extremely low wages which do not enable the head of the family to feed, clothe and maintain his children adequately. Consequently the children frequently suffer from severe deficiency especially during the long icy winters with the result that they die in large numbers or show very serious growth

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\* Summary of an article by M<sup>é</sup>decin-Col. I. G. Bernier, formerly Professor of the Faculty of Medicine in Kabul which appeared in the *Revue d'hygiène et de médecine sociale* 1956 4: 687.

By 1955 the rural population of over 3 000 000 people had been treated either as cases or as contacts. Cases comprised people with signs, symptoms or history suggestive of yaws. The contacts made up the rest of the population. The dosage used was 0.6 mega units of PAM for cases and 0.3 mega units for contacts regardless of age. Subsequent sample resurveys showed that the prevalence of active yaws had been reduced from a high figure to less than 1%. The improvement in the general activity of the population has been recognized with satisfaction by the Haitian Government. Present activities in the campaign are bringing the yaws situation to an eradication level.

Other yaws eradication projects jointly assisted by WHO and UNICEF include certain of the Caribbean Islands where yaws has long been known and much effort has been made against it. A yaws eradication campaign is planned in Brazil; national yaws campaigns have been carried out in Colombia, Venezuela and Ecuador. A seminar on endemic treponematoses eradication was held in 1956 in Port au Prince by the Pan American Sanitary Bureau (acting as the WHO Regional Office for the Americas) with the co-operation of the Government of Haiti and was attended by 48 public health administrators and treponematoses specialists from the different countries affected in the Region. At this seminar the practicability of yaws eradication was again stressed as was the need for initiating yaws eradication campaigns in places where the disease was still endemic, the efforts being co-ordinated so as to prevent reintroduction of yaws to areas already freed of the disease.

#### *Africa*

The first WHO/UNICEF assisted yaws project in Africa started in Liberia in 1953. It is based at Kpoin in the hinterland near the French Guinea border. Total mass treatment has been carried out with great success. The campaign is being rapidly extended to cover the whole Republic. Already over 400 000 persons have been examined and treated at initial treatment surveys and over

250 000 persons have been examined at resurveys. Yaws campaigns are in action in Nigeria in each of the three regions and in the British Cameroons. Here again total mass treatment has reduced the prevalence from 20/30% to about 1% within a year. Over 3 million people have been examined and over 2 million treated. The campaign in Nsukka in the East-ern Region of Nigeria, is remarkable for the development of rural health centres financed by local African councils in areas where the beneficial effects of the campaign have been experienced. Resurveys are made by yaws scouts whose work has been shown to be good. Other WHO/UNICEF yaws campaigns are in operation in French Togoland, Ghana (Gold Coast) and Sierra Leone. Campaigns are being planned in other parts of Africa.

At the International Conference on Yaws Control held in Enugu in Africa, a campaign to eradicate yaws was envisaged. Following this a meeting of representatives of the health administrations of Sierra Leone, Liberia, French West Africa, Ghana and French Togoland was called by WHO in Accra in August 1956 with the object of co-ordinating anti yaws activities along the borders between the westerly territories of West Africa. There can be little doubt that the way is now open for the eradication of yaws from Africa.

#### *South East Asia*

The first anti yaws campaign in this region started in Indonesia in 1950. The Republic has a population of some 80 million persons with an estimated average prevalence of active yaws of about 12%. The problem is gigantic but the campaign, planned and administered by Dr R. Kodijat, is making good and rapid progress. It is now largely based upon the polyclinic in the smallest semi-autonomous unit—the sub-district—which has an average population of about 30 000 persons. These surveys are carried out by the "djuru patek", usually a suitably trained young villager, while the trained nurse of the polyclinic goes to the village at about four-day intervals and checks the diagnoses and



## Organization of anti yaws measures

The minimum dose of long acting penicillin (PAM) for adults with active yaws is 1.2 mega units (4 ml) with proportionately smaller doses for children. If the prevalence of active yaws is high all active cases are treated and the rest of the population is considered as latent cases or contacts and given half doses. This is total mass treatment. If because of local conditions it is not practicable to treat the latent cases and contacts then the reduction of the prevalence of yaws to a level at which it is not at the time a public health problem will take longer. More resurveys will however be required than if total mass treatment had been carried out. Effective yaws control can nevertheless be achieved by repeated resurveys. Whatever treatment policy is carried out resurveys will be needed to find out the prevalence of yaws following the mass treatment and to treat any active cases that may have developed or moved into the area and the close contacts of infectious cases.

It has also become apparent that the aim should be to see all the population at the initial treatment surveys and at the resurveys. For this and all other aspects of yaws eradication and in fact for any public health activity it is essential to win the intelligent co-operation of the people. However difficult the task may be it cannot be neglected with impunity. If the people do not understand what is being done and why it is being done the risks of misunderstanding and distrust are always present and co-operation will lack the vital quality which is present only when people really feel the need for the assistance offered.

Even when the prevalence of yaws has been reduced to a low level there is a paramount need for continued surveillance so that any infectious cases may be immediately recognized and treated. Only thus will transmission cease and eradication be achieved. The activities needed in the later stages are perhaps less dramatic than those of the mass treatment stage but they are just as important. The national health administrations and the civil rural administrations who will be

required to assist in the financing of the campaign must be made aware of the requirements of these later stages while the project is being planned.

To avoid spending large sums of money in finding the last few cases in the final stages of an eradication campaign the resurveys should be done simply and economically by trained searchers or if possible linked to some other public health activity of a similar nature.

The surveillance of the population can best be based upon rural health centres which if not already in existence should be planned and provided for at the outset of the campaign. This will require finance and adequate trained staff both of which are difficult to get. Obtaining qualified personnel is often particularly difficult and may necessitate the expansion of training facilities. Auxiliary staff trained for yaws campaigns should be given further training later and absorbed into other health activities.

Closer supervision of staff is necessary at all stages of the campaign so as to maintain adequate work standards and avoid demoralization. The arduous nature of the field work and the qualities of those engaged in mass campaigns should be recognized by ensuring that they are at no disadvantage compared with those in more routine and sedentary posts. Adequate simple returns of the work done and of the prevalence of yaws at each survey should be maintained so that the progress of the campaign can be assessed. To increase the usefulness of such data sample serological surveys should be combined with the clinical surveys.

Although the technical knowledge required to carry out a successful yaws eradication campaign is readily available the organizing and administrative skill to put it into successful effect demands the close attention, interest, patience and drive of all those responsible.

## Results

### *The Americas*

In the Americas the outstanding campaign has been that in Haiti which started in 1950.

By 1955 the rural population of over 3 000 000 people had been treated either as cases or as contacts. Cases comprised people with signs, symptoms or history suggestive of yaws. The contacts made up the rest of the population. The dosage used was 0.6 mega units of PAM for cases and 0.3 mega units for contacts regardless of age. Subsequent sample surveys showed that the prevalence of active yaws had been reduced from a high figure to less than 1%. The improvement in the general activity of the population has been recognized with satisfaction by the Haitian Government. Present activities in the campaign are bringing the yaws situation to an eradication level.

Other yaws eradication projects jointly assisted by WHO and UNICEF include certain of the Caribbean Islands where yaws has long been known and much effort has been made against it. A yaws eradication campaign is planned in Brazil. National yaws campaigns have been carried out in Colombia, Venezuela and Ecuador. A seminar on endemic treponematoses eradication was held in 1956 in Port au Prince by the Pan American Sanitary Bureau (acting as the WHO Regional Office for the Americas) with the co-operation of the Government of Haiti and was attended by 43 public health administrators and treponematoses specialists from the different countries affected in the Region. At this seminar the practicability of yaws eradication was again stressed as was the need for initiating yaws eradication campaigns in places where the disease was still endemic, the efforts being co-ordinated so as to prevent reintroduction of yaws to areas already freed of the disease.

#### *Africa*

The first WHO/UNICEF assisted yaws project in Africa started in Liberia in 1953. It is based at Kpoin in the hinterland near the French Guinea border. Total mass treatment has been carried out with great success. The campaign is being rapidly extended to cover the whole Republic. Already over 400 000 persons have been examined and treated at initial treatment surveys and over

250 000 persons have been examined at resurveys. Yaws campaigns are in action in Nigeria in each of the three regions and in the British Cameroons. Here again total mass treatment has reduced the prevalence from 20/30% to about 1% within a year. Over 3 million people have been examined and over 2 million treated. The campaign in Nsukka in the Eastern Region of Nigeria is remarkable for the development of rural health centres financed by local African councils in areas where the beneficial effects of the campaign have been experienced. Resurveys are made by yaws scouts whose work has been shown to be good. Other WHO/UNICEF yaws campaigns are in operation in French Togoland, Ghana (Gold Coast) and Sierra Leone. Campaigns are being planned in other parts of Africa.

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treats only the yaws cases. The yaws campaign is integrated into the rural health services from the start and resurveys are automatic. The fall in yaws prevalence is much the same as that following total mass treatment but it takes two to three times as long. The effect in smothering the reservoir of relapsing yaws is excellent. An admirable scheme for the surveillance of the consolidation phase has been drawn up in Indonesia. In areas of over 30% yaws prevalence and in isolated or dispersed communities whatever the prevalence, total mass treatment will be carried out. Numbers involved in this latter operation alone are estimated to exceed 8 million. From the start of the campaign in 1950 up to the end of 1955 over 21 million persons had been examined once and nearly 14½ million more than once; a total of over 3½ million persons had received treatment.

An extensive campaign is also being carried out in Thailand during which 12 million persons have been examined and over one million treated. An inter-State yaws campaign is also in progress in India where, although the prevalence is rather low, careful work has greatly reduced the number of active cases.

### *Western Pacific*

The first campaign against yaws in this geographically dispersed region began in 1951 in the Philippines where it is now being carried out mainly from the recently developed rural health units. Good progress is being made and the prevalence of yaws has

been greatly reduced. Laos also initiated a campaign and one was started later in Malaya. In both areas the prevalence found was not high.

Campaigns in the island territories of Fiji, Western Samoa and the British Solomon Islands Protectorate were started in 1954 and have been very successfully carried out with notable co-operation between the Government, WHO and the local inhabitants. In these islands most of the travelling has been of necessity by ship. A successful campaign was started in West New Guinea in 1955 and much arduous mountain travelling has been undertaken. Campaigns in other island groups are being planned.

It will thus be seen that throughout the world activities against yaws are widely spread and still expanding. They are also being co-ordinated regionally and subcontinentally.

In addition to exerting a beneficial effect on yaws patients through present and future campaigns, a more general improvement in personal hygiene, environmental sanitation and standards of living should be encouraged since in combination they will remove the conditions that make for the transmission of yaws and thus render complete eradication possible. There is already much evidence to show that the immediate and visible results of yaws campaigns are powerful factors favouring the development of more healthy living.

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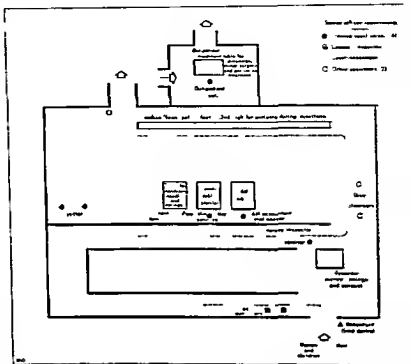
### *Quarantine and vaccination requirements*

A recent supplement to the WHO *Weekly Epidemiological Record* (No. 7 Suppl. t) provides details of the situation on 15 February 1957 with regard to quarantine measures and vaccination certificate requirements. Information is given for some 170 States and territories throughout the world. The first part of the supplement shows in tabular form the position of States and territories under the International Sanitary Regulations. The second part consists of a detailed list of quarantine measures and vaccination requirements. The supplement concludes with the text of the reservations to the International Sanitary Regulations at present in force.

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# THE ORGANIZATION OF A YAWS ERADICATION CAMPAIGN

An illustrated feature based on experience in WHO assisted campaigns in Africa



Campaign for the elimination of yaws in Africa. The following are the main components of the campaign: surveillance, treatment, and education. The campaign is organized into three main phases: pre-campaign, campaign, and post-campaign. The pre-campaign phase involves the establishment of a regional committee, a national committee, and a district committee. The campaign phase involves the implementation of surveillance, treatment, and education activities. The post-campaign phase involves the evaluation of the campaign and the establishment of a permanent surveillance system.

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respiratory system (particularly pulmonary tuberculosis) occurred between the ages of 20 and 30 years among women and between 40 and 55 years of age among men. At the present time the highest rate is observed among even older persons (over 60 years) for both men and women.

Once again the statistics show that there has been a very marked decrease regardless of age in mortality from tuberculosis of the respiratory system.

## Reports of Expert Groups

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### MATERNAL AND CHILD HEALTH SERVICES

In recent years there has been an unprecedented expansion of MCH (maternal and child health) activities in all parts of the world. The very rapidity with which new programmes have been developed has impelled administrators to initiate new activities which have as yet been untried in their communities. As the size and complexity of modern programmes increases the need is being felt to substitute sounder, more scientific and business-like methods for the idealistic and haphazard approach of the

WHO *Maternal and Child Health Services* 1957 115 pp. Price 19 50 30 S. 1—Published in English, French, and Spanish.

early pioneers whose enthusiasm made up [for the lack] of administrative skills."

The development of a comprehensive MCH programme and the integration of MCH activities into the general public health and medical services are discussed in the second report of the WHO Expert Committee on Maternal and Child Health<sup>1</sup>.

Principles of programme planning, organization and structure of MCH services and techniques of administration are examined.

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### ADDICTION PRODUCING DRUGS

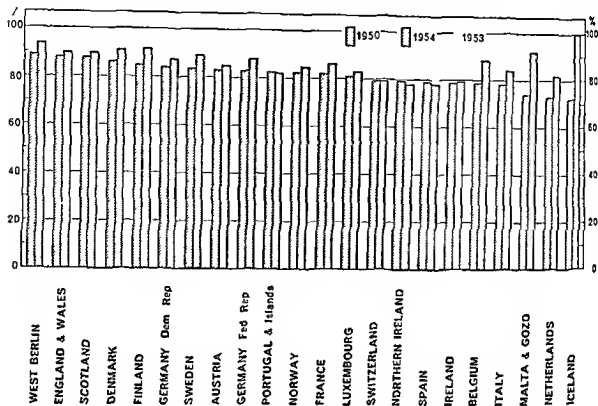
In the seventh report of the WHO Expert Committee on Addiction Producing Drugs it is recommended that the following morphine-like synthetic substances of pethidine type be considered addiction producing drugs and therefore subjected to the relevant international control 1-(*p*-aminophenyl)-

ethyl-4-phenylpiperidine-4-carboxylic acid ethyl ester and 1-methyl-3-ethyl-4-phenyl-4-propionoxypiperidine.

The report also deals with several matters of general interest. *Inter alia* the Committee suggested that WHO should study the possibility of organizing, as an adjunct to the technical assistance for narcotics control symposia or seminars on various problems of drug addiction and addiction producing

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FIG 2 DEATHS FROM TUBERCULOSIS OF THE RESPIRATORY SYSTEM AS PERCENTAGE OF TOTAL TUBERCULOSIS MORTALITY IN EUROPE 1950 AND 1954



lity rate rises sharply at puberty and may continue to rise up to the age of 25 years and over according to the country. The peak is generally reached towards adulthood and sometimes during old age.

It is also interesting to note the decrease in mortality from tuberculosis in relation to general mortality for the period in question. Although it is still one of the ten principal causes of death, tuberculosis is no longer responsible for such a large proportion of general mortality as are heart diseases, cancer, diseases of early infancy or accidents.

According to the statistics published by WHO (see Fig 1) the ratio of tuberculosis mortality to general mortality varied from 1.5% in Denmark to 11.7% in Portugal for 1950 and from 0.9% in Denmark and Iceland to 5.6% in Portugal for 1954. It is true of course that—systems of notification of causes of death not yet being perfect—there

is a certain margin of error. This margin is represented by the percentage of total deaths which is classified under the headings

"Unknown cause and Senility." There is no doubt that some deaths from chronic tuberculosis among old people have been classified under Senility. It should also be noted that the tuberculosis mortality rate is higher among men than among women and that this difference becomes more marked with every year of age as the statistics for the countries studied show.

Of the various forms of the disease, tuberculosis of the respiratory system (pulmonary tuberculosis in particular) is still the principal cause of death. The percentage of deaths from tuberculosis of the respiratory system in relation to deaths from all forms of tuberculosis varied in 1950 from 72.4 in Iceland to 89.1 in West Berlin (see Fig 2). In 1954 the percentage rose everywhere except in Northern Ireland, Portugal, Spain

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*MCH & Cr. Tech. R. Ser. 1957 116. 15 pages. Price 1/9 50/30 Sw. f. 1 - Published in English, French, and Spanish.*



drugs. In addition the Committee was of the opinion that the time was ripe for emphasizing again the distinction between addiction and habit and approved the definition of certain characteristics of drug habituation.

The abuse of amphetamines is still a serious problem even in Japan where the position has improved. Consequently governments should provide adequate measures of control to prevent any abusive use of such substances.

In view of the fact that the situation con-

cerning the abuse of barbiturates has not ameliorated the Committee was of the opinion that control measures at the national level are necessary.

Finally the attention of the Committee was drawn to the excessive consumption of drugs known as "tranquilizers" and ataraxics. It is considered that these substances are potentially habit forming for this reason their use should be subjected to the same control measures as that of the barbiturates.

## Notes and News

### Research on deprivation of maternal care

The Research Unit of the Tavistock Clinic and Tavistock Institute of Human Relations London has been engaged for a number of years in research into the ill effects on the child's development of deprivation of maternal care. The World Health Organization through its Regional Office for Europe and the International Children's Centre have both taken an interest in the work of this Unit and have provided grants covering about half the cost during the five year period 1951-55. The director of these studies Dr John Bowlby—whose earlier connexion with WHO resulted in the well received monograph *Maternal care and mental health*<sup>1</sup>—has just submitted a report to WHO reviewing the research work undertaken during these five years. Dr Bowlby acknowledges the Unit's great indebtedness to both WHO and the Centre for supporting the work during its early phases at a time when recognition of its importance was still limited. Help from other sources which has since

been forthcoming will enable the work to progress on an expanded scale during the years 1957-61.

As a starting point the Research Unit held as proved that separation from the mother endangers mental health and its efforts have been concentrated on defining the influence of the many factors brought into play on elucidating the psychological processes involved and on establishing the consequences to the developing personality of various kinds of separation experience. All these investigations have an obvious significance for preventive mental health work.

Dr Bowlby reports that despite the progress which has been made during the five years under review the Unit is still far from having established in detail the consequences of various kinds of separation experience. The work undertaken falls under four main heads:

(1) Studies of the emotional responses of infants and young children during the time of separation and soon after their return home.

(2) Studies of the later personality development of children who have experienced a prolonged separation in early childhood.

(3) An evaluation of different research strategies for use in studying the problem and

<sup>1</sup> Bowlby J (1952) *Maternal care and mental health*. 2nd ed., Geneve (Nid Health Oganizati n Af gh Seri No 1). This is a study of the mental health aspects of the problem of homeless children. It provides abundant information on the question—very important for the later development of the child—of the care given by parents during the first years of life. The author illustrates the importance of direct physical contact in improving the care given to the family—especially imperfect or absent in preference to institutional care.

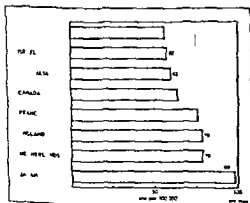
(4) Informing professional colleagues of the nature of the problems presented and joint consideration of means of obviating or mitigating the severity of the experience

The work done has served abundantly to confirm the Unit's main thesis namely that infants and young children should never be separated from the parents until every alternative measure has proved impracticable that where a child has to be removed, he must be provided with a substitute mother to whom he may look for security until he can return home and that during the interlude frequent and regular contact between child and parent is to be encouraged. The more interesting of the specific findings are (1) that a small but significant proportion of children exposed to the risk of prolonged separation sustain serious damage which in many cases may be very grave and (2) that research should now be aimed chiefly at exploring the variety of conditions which seem to affect responses to separation together with direct observation of the nature of these responses

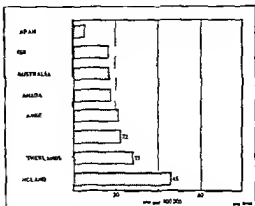
#### Variations in cancer mortality

Differences between countries in the mortality from cancer in various sites have baffled pathologists for a long time. Among the unexplained differences are those observed

AGE ADJUSTED MORTALITY RATES FOR CANCER OF THE DIGESTIVE ORGANS IN MALES



AGE ADJUSTED MORTALITY RATES FOR CANCER OF THE RESPIRATORY SYSTEM IN MALES



in Japan where the number of deaths from both cancer of the digestive organs and cancer of the uterus is higher than that recorded in Australia, Canada, England and Wales, Israel, the Netherlands and the USA. On the other hand, mortality from cancer of the respiratory system in males in Japan is lower than in any of the seven other countries. Of all the eight countries, England and Wales have the highest death rates from cancer of the respiratory system, but the death rates from cancer of the breast and cancer of the male genital organs are surprisingly low in Japan as are those from cancer of the uterus in Israel.

These conclusions can be drawn from a recent statistical study prepared by A. J. Phillips and Margaret Owhar published in Volume 16 No. 2 of the *Bulletin of the World Health Organization*. This study is particularly concerned with cancer in the following sites: buccal cavity and pharynx, digestive organs and peritoneum, respiratory system, breast (female), uterus, genital organs (male) and urinary organs.

#### Field difficulties in malaria eradication

Some of the difficulties encountered in eradicating malaria in the more remote areas of the world are well illustrated by the methods which have had to be adopted in

certain parts of Sarawak where the Government is actively conducting an eradication campaign with the help of WHO and the United Nations Expanded Programme of Technical Assistance. In this country only a little smaller than England the roads are almost entirely confined to the coastal towns and settlements and travel in the interior is made on foot through the jungle or by prahu along the innumerable rivers. However the prahu a wooden canoe is not ideal for all the conditions met on the waterways of Sarawak and one WHO entomologist François Lachance has found it necessary to turn his hand to boat building designing a speed boat for the larger rivers and a flat bottomed boat for the shallow tributaries which the deeper draught prahu cannot negotiate.

But even this inventiveness will not serve to get supplies into the remote jungle areas away from the rivers. One such area is the Kelabit plateau of about 1000 square miles near the border of Sarawak and Indonesian Borneo. In order to make eradication operations possible Dr Michael Colbourne a WHO malariologist who is the leader of the Sarawak Malaria Project and Dr W Glyn Evans Director of Medical Services of the Sarawak Government recently arranged with the Royal Air Force at Singapore for some 30 bags of DDT and medical supplies to be dropped by parachute at Bario on the Kelabit plateau where a WHO malaria control team was waiting. A similar airdrop had been organized in 1954 in Lio Matu at the head waters of the Baram river. This has proved to be the only effective means of getting supplies to the inaccessible parts of the country just how inaccessible they can be is shown by the fact that it took the team conducting the spraying operation on the Kelabit plateau 18 days of river travel and jungle trekking to reach the airdrop area.

It will take them about six weeks to spray the villages in the district with insecticide but it is expected that their efforts will meet with considerable success as the effectiveness of residual spraying in controlling the Sarawak malaria vector *Anopheles leucosphyrus* has already been clearly demonstrated.

## Eradicating murine typhus fever

Murine typhus fever is endemic in those regions of the United States of America which have an average January temperature of above 40 F and an average relative humidity of 37% in July. Although it is now unknown in most towns the disease still persists in scattered foci on isolated farms and agricultural premises. Some 5000 cases of murine typhus were notified in the United States in 1945 but this figure should probably be doubled to allow for unreported cases. On the other hand in 1954 only about 200 cases were reported.

The control of rats and their ectoparasites—the fleas which carry the disease—certainly played a large part in this decrease. Indeed it is in those counties which apply rodenticides and pulicides in accordance with the programme undertaken by the US Public Health Service and State health agencies that the decrease has been most pronounced.

A systematic and controlled test of the feasibility of eradication by using anti-coagulants against rats and DDT against fleas was carried out in 1953-54 in the south-eastern part of Grady County Georgia and is described by C O Mohr and W W Smith in the *Bulletin of the World Health Organization* (1956 Vol 16 No 2). Before the commencement of the campaign it was estimated that 50% of the 713 agricultural premises in the area were rat infested. Typhus fever antibodies were found in rats trapped in 63% of these premises and 44% of the rats examined gave positive serological tests for the disease.

In the course of the ten months covered by the campaign rats disappeared from 89% of the infested premises. This result was achieved by using about 2 kg of DDT dust and some 5 kg of poisoned bait for every building at a cost of \$20. An average of 88 days was necessary to obtain an effective result for each building.

This treatment also considerably reduced the number of fleas (*Xenopsylla cheopis*, *Echudnophaga gallinacea*, *Polyplox spinulosa*). Although the rats again invaded about 25% of the same premises in the course of a period

of 18 months murine typhus seems to have disappeared from the area as the rat and flea population no longer reaches the minimum level necessary for the maintenance of the disease.

It is probable that similar measures could be successfully applied for the eradication of murine plague occurring in commensal rodents since this disease is also maintained in rats by infestation of *Xenopsylla cheopis*.

#### Seminar on mentally handicapped children

An international seminar on the mental health of the subnormal child will be held in Oslo from 25 April to 3 May 1957. The meeting has been arranged by the Regional Office for Europe of the World Health Organization in co-operation with the Norwegian Government and the European Office of the United Nations Technical Assistance Administration.

The seminar will be concerned with general positive measures to improve mental health and the attitude of families so that mentally handicapped children may benefit to the fullest extent from education, find useful employment and eventually take their place in the community.

It will be attended by public health administrators, child psychiatrists, paediatricians, psychologists, medico-social workers and educators. Participants have been invited from the following 13 countries: Austria, Denmark, Finland, Federal Republic of Germany, Iceland, Ireland, the Netherlands, Norway, Poland, Sweden, Switzerland, the United Kingdom and Yugoslavia. There will be about 40 participants in all.

The purpose of this meeting is to spread knowledge of modern practices relating to mentally handicapped children. Among the topics that will be discussed are: the number of mentally handicapped children and the services provided for them; the detection of mental handicap; the needs of parents whose children are thus handicapped; social work for these children and their families; educational problems and employment.

#### Regional training course on rabies

The Regional Training Course on Rabies to be held in Caracas, Venezuela from 31 March to 13 April is the third of its kind organized by WHO to serve different regions of the world. The first course was held in Coonoor, India in July 1952 and was attended by 55 rabies workers from 23 countries of the Western Pacific, South East Asia and Eastern Mediterranean Regions. The second course was held in Muebea, Kenya and was attended by 40 representatives from 22 African countries. It is anticipated that approximately 40 rabies workers from 18 countries of Latin America will attend the Caracas meeting.

The purpose of these meetings is to provide the latest information on the prevention and control of rabies in both man and animals. The meetings fulfil an additional function in promoting the adoption of more uniform techniques and principles in important aspects of rabies so that work accomplished in different parts of the world will have more satisfactory bases of comparison than has been the case until now.

In most of the Latin American countries rabies is a severe problem. Although the dog continues to be the principal reservoir of the disease in the majority of these countries, the problem of rabies in bats is of great public health and economic importance. For over 50 years it has been known that vampire bats can transmit rabies to animals and in the past few years these observations have extended to insect-eating bats on the North American continent. Human beings have been exposed to the bites of rabid bats and deaths have often resulted. Economically, rabies transmitted by vampire bats is very important in live stock producing countries such as Brazil and Mexico and each year hundreds of thousands of animals have to be inoculated to forestall the great losses which would otherwise result.

The meeting in Caracas will be held at the National Institute of Hygiene. The discussion leaders will include several of the outstanding world authorities on rabies including Dr Karl Habel of the National

certain parts of Sarawak where the Government is actively conducting an eradication campaign with the help of WHO and the United Nations Expanded Programme of Technical Assistance. In this country only a little smaller than England the roads are almost entirely confined to the coastal towns and settlements and travel in the interior is made on foot through the jungle or by prahu along the innumerable rivers. However the prahu a wooden canoe is not ideal for all the conditions met on the waterways of Sarawak and one WHO entomologist François Lachance has found it necessary to turn his hand to boat building designing a speed boat for the larger rivers and a flat bottomed boat for the shallow tributaries which the deeper draught prahu cannot negotiate.

But even this inventiveness will not serve to get supplies into the remote jungle areas away from the rivers. One such area is the Kelabit plateau of about 1000 square miles near the border of Sarawak and Indonesian Borneo. In order to make eradication operations possible Dr Michael Colbourne a WHO malariologist who is the leader of the Sarawak Malaria Project and Dr W Glyn Evans Director of Medical Services of the Sarawak Government recently arranged with the Royal Air Force at Singapore for some 30 bags of DDT and medical supplies to be dropped by parachute at Bario on the Kelabit plateau where a WHO malaria control team was waiting. A similar airdrop had been organized in 1954 in Lio Matu at the head waters of the Baram river. This has proved to be the only effective means of getting supplies to the inaccessible parts of the country just how inaccessible they can be is shown by the fact that it took the team conducting the spraying operation on the Kelabit plateau 18 days of river travel and jungle trekking to reach the airdrop area.

It will take them about six weeks to spray the villages in the district with insecticide but it is expected that their efforts will meet with considerable success as the effectiveness of residual spraying in controlling the Sarawak malaria vector *Anopheles leucosphyrus* has already been clearly demonstrated.

## Eradicating murine typhus fever

Murine typhus fever is endemic in those regions of the United States of America which have an average January temperature of above 40 F and an average relative humidity of 37% in July. Although it is now unknown in most towns the disease still persists in scattered foci on isolated farms and agricultural premises. Some 5000 cases of murine typhus were notified in the United States in 1945 but this figure should probably be doubled to allow for unreported cases. On the other hand in 1954 only about 200 cases were reported.

The control of rats and their ectoparasites—the fleas which carry the disease—certainly played a large part in this decrease. Indeed it is in those counties which apply rodenticides and pulicides in accordance with the programme undertaken by the US Public Health Service and State health agencies that the decrease has been most pronounced.

A systematic and controlled test of the feasibility of eradication by using anti-coagulants against rats and DDT against fleas was carried out in 1953-54 in the south eastern part of Grady County Georgia and is described by C O Mohr and W W Smith in the *Bulletin of the World Health Organization* (1956 Vol 16 No 2). Before the commencement of the campaign it was estimated that 50% of the 713 agricultural premises in the area were rat infested. Typhus fever antibodies were found in rats trapped in 63% of these premises and 44% of the rats examined gave positive serological tests for the disease.

In the course of the ten months covered by the campaign rats disappeared from 89% of the infested premises. This result was achieved by using about 2 kg of DDT dust and some 5 kg of poisoned bait for every building at a cost of \$20. An average of 88 days was necessary to obtain an effective result for each building.

This treatment also considerably reduced the number of fleas (*Xenopsylla cheopis*, *Echidnophaga gallinacea*, *Polypav spinulosa*). Although the rats again invaded about 25% of the same premises in the course of a period

Yugoslavia The following experts have been invited to participate at the meeting as lecturers Mrs I G Doherty Secretary to the Occupational Health Section The Royal College of Nursing London Professor Sven Forssman President of the Permanent International Commission of Industrial Medicine Stockholm Dr J J Gillon Mécécin Inspecteur General de la Médecine du Travail et de la Main-d'œuvre Paris M<sup>lle</sup> M L Ginot Assistante-conseil auprès de la Compagnie des Industries des Textiles artificiels et synthétiques Paris Professor R E Lane Nuffield Professor of Occupational Health University of Manchester Manchester M<sup>lle</sup> Gh van Massenhove Infirmière-chef Union Chimique Belge Bruxelles Dr Lilywelyn Roberts Medical Officer of Health Sheffield Miss Ruth Saynajarvi Industrial Nursing Consultant Institute of Occupational Health Helsinki

#### Expert committee on yellow fever vaccine

Under the International Sanitary Regulations which came into force on 1 October 1952 an international certificate of vaccination against yellow fever is valid only if the vaccine used has been approved by WHO The standards to which yellow fever vaccine was to conform were specified by UNRRA and dealt with the preparation preservation and administration of the vaccine These standards were published in 1945 in the UNRRA *Epidemiological Information Bulletin* under the title *Standards for the Manufacture and Control of Yellow Fever Vaccine* they were subsequently adopted by WHO and are still in force It is now generally felt that although the UNRRA Standards have served a useful purpose over the past years there is a need to reconsider them in order to bring them up to date with recent developments

The Expert Committee on Yellow Fever Vaccine which will meet in Geneva from 8 to 13 April 1957 will be studying technical questions concerning these Standards and a number of related laboratory problems It is for instance of particular importance

that the yellow fever virus strains which are used for vaccine production should maintain their ability to confer immunity to yellow fever in vaccinated people without causing harmful side reactions It is felt that wider international collaboration could help to ensure this One particular problem the committee will be discussing in this connexion is that of encephalitis the most feared side reaction to which yellow fever vaccination may give rise

Another important matter to be considered by the committee is how to make certain that the methods used to check the immunity resulting from vaccination give comparable and reproducible results it would be desirable to achieve international co-operation on this subject The most common method of checking immunity is to show by the mouse protection test that the vaccination stimulates antibody production in the blood serum and it is hoped that a way may be found to ensure that the results obtained with this test in different laboratories can be compared

The following experts have been invited to attend Dr F N Macnamara Director of the Western African Council for Medical Research Laboratories Yaba Lagos Nigeria Dr Rumeno Isaac Diaz, Medico Jefe de la Division de Fiebre Amarilla y Peste Ministerio de Sanidad y Asistencia Social Caracas Venezuela Dr P Lepine Chef de Service Institut Pasteur Paris France Professeur J Laigret, Directeur de l'Institut d'Hygiène et de Bactériologie Université de Strasbourg Strasbourg, France Dr A. Gast Galvis Directeur Instituto de Estudios Especiales Carlos Finlay Bogota Colombia Dr K C Smithburn The Rockefeller Foundation, Johannesburg, Union of South Africa.

#### Malaria conference in Belgrade

Malaria eradication in south-eastern and eastern Europe will be discussed at a conference to be held in Belgrade from 26 to 29 March 1957 The meeting, which is sponsored by the Government of Yugoslavia

Institutes of Health Bethesda Md Dr Hilary Koprowski Assistant Director of Viral and Rickettsial Research Lederle Laboratories New York Dr E S Tierkel Veterinary Public Health Division United States Public Health Service Communicable Disease Center Atlanta Ga Dr Jordi Casals Rockefeller Foundation Virus Laboratories New York and Dr C F Part of the City of Los Angeles Department of Health These discussion leaders will be assisted by medical and veterinary specialists of the Pan American Sanitary Bureau (which acts as WHO Regional Office for the Americas) The meetings will consist of lectures and discussions in the morning followed by laboratory sessions in the afternoon during which the representatives from the various countries will work on diagnostic procedures and the production and potency testing of vaccines and serum under the close supervision of the discussion leaders The discussions will include full consideration of the problems of field control involving dogs domestic live stock and wild life

This meeting is part of a long range programme being carried out by the Pan American Sanitary Bureau on rabies control activities in Latin America

### Seminar on the nurse in industry

There is general agreement that the nurse has an important role to play in connexion with the health and welfare of the worker Indeed in those countries where her value has been fully recognized the nurse working in industry not only deals with emergency and primary treatment of accidents and illnesses and the maintenance of records and statistics but also has duties in connexion with pre placement and other medical examinations arranging follow up treatment health education and counselling At the same time she assists in the supervision of factory hygiene and accident prevention and co operates with the various community health services to which workers may be referred

Investigations and consultations within the European Region have revealed that

due mostly to economic difficulties lack of understanding or shortage of training facilities the industrial nurse is often neither adequately trained nor properly utilized in industry

These considerations led ILO and the Regional Office for Europe of WHO to organize a seminar in 1957 with the object of collecting more information on what is done in this field at the national level facilitating exchange of experience stimulating the establishment and the development of services and discussing the required educational programmes

The meeting thanks to the hospitality offered by the Government of the United Kingdom will be held in London from 25 April to 4 May 1957 Its agenda will include implications of the industrial environment on the basic health and welfare needs of the worker personnel concerned with health and welfare needs in industry scope of industrial nursing scope of industrial social work functions of the industrial nurse working with or without an industrial medical officer differences in requirements for nursing services according to the size of the factory and the type of industry nurse relationships in the factory liaison and co ordination of industrial nursing service with health social and welfare services provided for the community and professional education of the industrial nurse basic post basic and supplementary

In order to obtain the widest possible variety of opinion the seminar will bring together industrial nurses social workers industrial medical officers medical officers of health and medical inspectors of factories from 15 European countries A questionnaire has been sent in advance to the participants with a view to discovering similarities and differences in the practice of industrial nursing and in the background against which the work is carried out

Participating countries will be Belgium Bulgaria Czechoslovakia Finland France Germany (Federal Republic) Italy Luxembourg Netherlands Norway Poland Sweden Switzerland United Kingdom and

Palais des Nations Geneva Switzerland  
This publication contains the various specifications established by the WHO Expert Committee on Insecticides at its second,

third fourth fifth and sixth sessions for the various pesticides against vectors of diseases of man and for apparatus for applying those pesticides

## People and Places

### MALARIA ERADICATION IN LATIN AMERICA

The first meeting of the Directors of the Malaria Eradication Services of Argentina, Bolivia, Brazil, Paraguay and Peru was held recently in Cochabamba, Bolivia. This meeting which was convened jointly by the Bolivian Government and the Pan American Sanitary Bureau (which acts as WHO Regional Office for the Americas) provided an opportunity for the participants to report on the progress made in their respective campaigns and to discuss the problems which have arisen—the latter being of particular value for future operations. Three similar meetings in recent years have received organizational help from PASB/WHO.

### FOURTH RIVER PLATE FRONTIER HEALTH MEETING

Brazil was the host country to the Fourth River Plate Frontier Health Meeting, which took place recently in Porto Alegre under the sponsorship of the Pan American Sanitary Bureau (which acts as WHO Regional Office for the Americas). These meetings are held in accordance with the Pan American Sanitary Agreement of 13 March 1948 of which Argentina, Brazil, Paraguay and Uruguay are the signatories. The four countries recognized by this Agreement, the necessity of co-ordinating permanent preventive measures in respect of the many epidemiological problems common to their adjoining border regions.

The three earlier meetings were held in Salta, Argentina, in March 1948, Montevideo in July 1953 and Asunción in August 1955. The discussions at this particular meeting covered a wide range of subjects including such important health problems as malaria, mumps, hydrotyphoid and polio.

The value of the new approach to common problems has been well illustrated by the results of these periodic gatherings. Other similar border health agreements exist notably those of May 1946 between Bolivia, Chile and Peru and of March 1948 between Argentina, Bolivia and Paraguay. Mexico and the USA have collaborated on border health problems since the days of the Second World War.

### DRUG CONTROL CONSULTANT BRAZIL

The Brazilian Government recently decided to establish a Federal Drug Control Laboratory and Service which will be responsible for the application of appropriate controls on all drugs offered for sale in the country.

The help of the Pan American Sanitary Bureau (which acts as WHO Regional Office for the Americas) was sought in developing this service and Mr Leslie Hart, of the United States of America, who served for many years in his country's Food and Drug Administration, has been appointed as a consultant to the Brazilian Government. Mr Hart's function is to advise the Director of the Service, Dr Rymundo Moniz de Aragão, on such matters as the establishment and operation of the laboratory, the development of field services and the review and preparation of drug control legislation. Advising on drug control services is a relatively new departure for PASB/WHO. Mr Hart took up his duties in Brazil in January of this year.

### NURSING TRAINING IN ARGENTINA

PASB/WHO officials have been assisting the Argentine Government in surveying that country's needs as regards nursing training. At the Government's request, the Organization has now assigned a consultant in nursing education, Miss Blanche Schnitzler, to assist in the reorganization of the Córdoba University School of Nursing. The Organization has also made provision for the granting of fellowships to selected candidates so as to help in building up an adequate faculty. Requests for assistance to other university schools of nursing in Argentina are under consideration.

During the last decade the development of hospitals and other health services in Argentina has far outpaced the supply of nurses. It is estimated that some 8000 additional graduate nurses are required to fill pressing needs. Even more urgent is the creation of a corps of nurses capable of assuming teaching, supervisory and administrative functions.

### NEW ASSIGNMENTS

The Pan American Sanitary Bureau (which acts as WHO Regional Office for the Americas) recently



and the WHO Regional Office for Europe will continue the work of the Malaria Conference held in Belgrade in December 1955<sup>1</sup>. Representatives of Albania, Bulgaria, Greece, Romania, Turkey, USSR and Yugoslavia will attend. The recommendations made by the Athens Inter Regional Malaria Conference in June 1956 will also serve as background to the forthcoming meeting in Belgrade.

In most of south eastern Europe malaria has been greatly reduced and eradication of the disease throughout the area is a practical possibility. An essential condition for eradication is close international co-operation—information on remaining pockets of malaria, on the control methods used and on mosquito resistance to insecticides needs to be continuously exchanged between countries and well co-ordinated operations are required at the very least in infected districts crossed by international boundaries. The forthcoming conference will review the progress achieved nationally in the various countries and will discuss the international aspects of malaria in south eastern Europe particularly in the light of the recommendations made in 1955. These include intensified exchange of information, the extension of bilateral agreements, the establishment of protective zones of about 20 km depth along frontiers and the adoption of uniform methods for determining the resistance of insects to insecticides. Information will also be exchanged on the latest technical developments in anti malaria work. At the request of the Bulgarian Government discussion will bear on the establishment of a joint plan for combating malaria in all the countries participating in the conference.

### Death of Dr John Friend Mahoney

The death of Dr John Friend Mahoney in New York in February will be deeply regretted both by his colleagues in the venereal disease field and by public health workers everywhere.

John Mahoney was born at Fond du Lac

Wisconsin USA on 1 August 1889 and graduated as an MD from Marquette University Milwaukee in 1914. Soon afterwards he became a student of Professor Hoffmann in Germany where he participated in studies on experimental syphilis. From that time he devoted himself to the laboratory aspects of the venereal diseases and as an officer of the United States Public Health Service was in charge of the Venereal Disease Research Laboratory, Manne Hospital, Staten Island, NY. It was there that the now universally accepted serological test—the VDRL test—was developed under his guidance.

Dr Mahoney will also be remembered in medical history for his discovery of the effectiveness of penicillin therapy in syphilis. His paper published in 1943 was the first of a series which later developments have shown to be the basis of a revolution in therapy, not only of venereal syphilis but also of the endemic treponematoses—yaws, bejel and pinta. The introduction of long acting penicillin preparations given in curative doses in single injections has made possible mass attacks against the treponematoses which are of economic importance in many under developed parts of the world.

Dr Mahoney was intimately associated with WHO in its treponematoses control programme from the very first stages and on several occasions was chairman of the WHO Expert Committee on Venereal Infections and Treponematoses. Through his consultant activities with WHO and other international organizations he exerted a profound influence on the orientation of venereal disease control programmes in many countries of the world.

### Specifications for pesticides

Corrigenda to the recently issued WHO publication<sup>1</sup> on this subject are now available and can be obtained free of charge on request to the World Health Organization.

*Specifi- cations for pesticides* In 11 lists and 11 lists  
molt 1 list and 1 list and 1 list and 1 list  
(W. H. O. Publications) 400 p. 22 figures 4 tables.  
Prs £2, \$3.00 or Sw fr 24.—(cloth bd.)

Another aspect of WHO's work for the strengthening of public health services is represented by the appointment of Mr Manuel S. P. Carrera, a public health engineer for duty with the international team currently assisting the Venezuelan Ministry of Public Health to set up a well balanced unit of rural health services in the Tuy River Valley.

Mr Carrera has been engaged in sanitary engineering work in Salvador Bahia, Brazil since 1944 and in 1954 he took over the post of professor of environmental sanitation in the Bahia School of Medicine in addition to his other duties.

#### INDIAN MALARIOLOGIST FOR INDONESIA

Dr Devraj Mehta, formerly Punjab State Malariologist, has recently taken up his new appointment as WHO malariologist with the Government of Indonesia.

Dr Mehta will assist the Indonesian Government in strengthening the malaria section of the Central Health Directorate in Djakarta and in the establishment of an institute for training personnel in the control of malaria and other insect-borne diseases.

He will join four WHO staff members already working in Indonesia under the Government's autumn malaria programme.

After taking his Ph.D. from Cambridge University, Dr Mehta carried out postgraduate work in malariology and entomology at the Harvard Medical School and later as a Special Fellow of the Rockefeller Foundation at the Puerto Rico Field Experiment Station. Dr Mehta is a member of the WHO Expert Advisory Panel on Infectious Diseases and of the Council of the National Society of India for Malaria and Other Mosquito-borne Diseases. He has also been a member of the Malaria Advisory Committee of the Indian Council of Medical Research.

**WHO HEADQUARTERS**

Mr H. C. Grant, Director of the WHO Division of Administrative Management and Personnel, has resigned with effect from 31 March 1957. As of 1 April 1957, Mr J. I. Armstrong, Chief of the Personnel Section, will assume the duties and responsibilities of Mr Grant's post.

Mr Grant was born in Canada in 1897 and was educated at the University of Manitoba (B.Sc., M.A.) and Stanford University, California (Ph.D.). He spent his early professional years in university teaching and research, leaving his post as professor of entomology in 1941 to join the Canadian Army. From the termination of hostilities until joining the WHO staff in April 1949, he was engaged in private practice as a management consultant. He now plans to return to this form of work, making his home in Toronto, Canada.

**Review of WHO Publications**

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#### TREPONEMATOSSES

*Bulletin of the World Health Organization*  
1956 Volume 15 Number 6 (pages 863-1096)

Since the International Symposium on Yaws Control in Bangkok in 1952, much practical experience has been gained in yaws campaigns in many parts of the world. It was upon knowledge derived from this experience and from careful field and laboratory work that the papers and discussions

were based at the International Conference on Yaws Control held in Enugu, Eastern Region, Nigeria in 1955. While all the papers prepared by participants to this second international conference contributed to its success, only a few of particular interest have been selected for publication in this issue of the *Bulletin*.

The general principles of yaws campaigns were set forth in the fourth report of the WHO Expert Committee on Venereal Infections and Treponematoses in 1952. These

World Health Organization (1953) *First Annual Report on Yaws Control*. Geneva: World Health Organization, Monograph Series No. 151. (Originally published in *Bull. Wld Hlth Org.* 1953, 8: 41-153.)

appointed Dr Oswaldo da Costa of Brazil as its zone representative for Central America and Panama in succession to Dr Stanford F Farnsworth. The zone office which is one of six such offices established for the purpose of decentralizing the Organization's work in the Americas is located in Guatemala City. Dr da Costa will be responsible for co-ordinating all PASB/WHO activities in British Honduras, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

Prior to joining the PASB/WHO staff in 1951, Dr da Costa served as a federal health officer in his own country's national Department of Health. His first appointment with the Organization was as a medical officer in the Health Promotion Branch in Washington. He subsequently served as chief of that branch and later as WHO medical adviser to the UNICEF Latin American Regional Office in Lima, Peru.

Dr Farnsworth has replaced Dr John D. Coltrell—who has been transferred to the WHO Regional Office for Europe—as Director of Health Services for the Eastern Mediterranean region. His career prior to taking up full time international work in 1952 included nine years' service with the California State Health Department and a further 10 years as health officer for the city of Oakland, Calif. In addition, Dr Farnsworth has made a number of health surveys for various municipalities and health agencies including the United States Public Health Service and the World Health Organization. In 1930-51 he visited Egypt on the latter's behalf.

#### MALARIA FIELD APPOINTMENTS

The appointment has just been announced of Dr Gerardo L. Adan of the Philippines to the staff of the international team now engaged in assisting the Government of Haiti in its malaria and *Aedes aegypti* eradication campaigns.

Dr Adan, who was previously the Philippine Government's counterpart to the WHO malaria control team leader in the Philippines, is taking over the direction of the team in Haiti. He will have his headquarters in Port au Prince.

Another recruit for work in this domain is Dr Juan A. Montalvan Cornejo of Ecuador. Dr Montalvan, a medical officer trained at the University of Guayaquil and the Johns Hopkins Medical School, USA, is to help the Government of the Dominican Republic in its current campaigns.

He was formerly Director of his own country's National Institute of Hygiene and Chief of the National Antimalaria Services. In addition, he held the post of professor of tropical medicine at the University of Guayaquil and has also been a member

of the WHO Expert Committee on Public Health Administration.

#### PAN AMERICAN FOOT AND MOUTH DISEASE CENTER

Dr William MacGregor Henderson of the United Kingdom is the new Director of the Pan American Foot and Mouth Disease Center at São Bento near Rio de Janeiro, Brazil. This centre, which serves the whole of the Americas Region, was established in 1951. It trains national laboratory and field staff for the control of foot and mouth disease and provides research facilities and consultative and diagnostic services.

Dr Henderson succeeds Dr Ervin A. Eichborn, who resigned last year to return to the United States. He is a doctor of science of Edinburgh University and a member of the Royal College of Veterinary Surgeons. Prior to taking up his new appointment, he was Deputy Director of the Research Institute (Animal Virus Diseases), Pirbright, England.

Dr Henderson is well known for his work on virus estimation. The method of virus estimation, given in his book *Quantitative Study of Foot and Mouth Disease* and known by his name, is in wide use in research institutes.

#### PAN AMERICAN ZOONOSIS CENTER

Dr Victor Bravo Moya of Chile has recently taken up his new duties as Chief of Laboratories of the Pan American Zoonoses Center at Azul, Argentina. In this capacity, he is responsible for organizing and supervising all laboratory phases of the centre's programme.

Dr Moya, who is an M.D. of the University of Chile and an M.P.H. of the University of Michigan, USA, was formerly Assistant Chief of the Departmental Laboratory of the Bacteriological Institute of Chile and Assistant Professor in the School of Public Health and Professor of Bacteriology in the School of Nursing, Santiago.

#### ORGANIZATION OF PUBLIC HEALTH SERVICES

The assistance PASB/WHO is now giving to the Bolivian Government in developing health services has been expanded recently by the appointment of Dr Ulpiano Blanco of Argentina to work in La Paz, in co-operation with international nursing and sanitary engineering staff. Dr Blanco is a medical officer who took his training at the University of the Littoral, Rosario, and the Johns Hopkins Medical School, USA. He was on the staff of the Argentine Health Services from 1943 onwards, serving most recently as a Regional Sub-Director of Public Health.

type of duster which has been developed in the United Kingdom with the express intention of overcoming the difficulties commonly encountered in anti louse campaigns.

There are three other important contributions in the same issue of the *Bulletin*. The first describes the results of the last of a series of laboratory and field studies of dried smallpox vaccines undertaken on behalf of the World Health Organization. Initiated in 1957 the first studies were designed to determine the heat stability of certain commercially produced dried vaccines. This work was carried out at laboratories in Copenhagen, Elstree and Paris on vaccines produced in Austria, France, Indonesia and the USA. It was found that while all the dried vaccines were more heat resistant than the corresponding glycerinated lymph one was markedly more resistant than the other three. This interesting result prompted a further investigation in which a second batch of the highly resistant vaccine was compared with a vaccine that had given promising results in another unpublished study. It is the results of this investigation that are reported here by W. C. Cockburn, R. M. Cross, A. W. Downie, K. R. Dumbell, C. Kaplan, D. McClean & A. M. M. Payne. The investigation was designed by the authors to determine the stability of the vaccine measured both in the laboratory and by success rates in primary vaccinations in man at temperatures likely to be met with in the tropics and to define the relationship between the results of laboratory potency tests and those attained in man. The laboratory work was done in the United Kingdom at the Lister Institute for Preventive Medicine, Elstree, and at the University of Liverpool, and the field work, as carried out through the co-operation of the Royal Air Force. The results showed one vaccine to be outstandingly stable, resisting 45 C for eight

months—a period which has been extended since the report was prepared to two years with no further significant deterioration. The great stability of this vaccine has led the WHO Expert Committee on Biological Standardization to initiate investigations as to the suitability of a vaccine prepared in this way for establishment as an International Reference Preparation. The method of preparation of the vaccine in question has already been published and recent modifications of the procedure are included in a summary of the method distributed by WHO. The use of such a vaccine should materially improve the prospects for controlling smallpox in hot countries. Another important result of the investigation is that a relationship between the findings in the laboratory and in man was determined and this has made it possible to define a minimum titre at which a vaccine may be expected to give the highest possible number of successful vaccinations.

The second paper is by E. Gras et al. who presents the results of a survey of the various methods used at present for the preparation and assay of antivenins in different countries. This work represents a valuable step towards the international standardization of antivenins. In this connexion the author stresses the fact that the great variety in the antigenic constitution of venoms will make it necessary to establish several international standard antivenins corresponding to groups of snakes which are characterized by venoms of the same or closely related constitution.

The final contribution by R. Pollitzer is the eighth of a series of studies on cholera which will eventually be published in the *World Health Organization Monograph Series*. This particular study deals with the clinical pathology of the disease covering all aspects from the loss of fluids and salts from the gastrointestinal tract to the physical and chemical changes in the blood of cholera patients and the problems of circulatory and renal failure.

against houseflies and culicine mosquitos the deposits lose their efficacy more quickly than do those of DDT so that they are unlikely to be as efficient for controlling anophelines

The limited scope of the organo phosphorus insecticides is not the only disadvantage from which these compounds suffer. Although certain of them are evidently quite safe the organo phosphorus compounds as a group are considerably more toxic to man than the chlorinated hydrocarbons. It is therefore probable that methods of application which have proved safe in the case of DDT would seriously endanger the health of the operators if they did not comply with the precautions recommended by experts for each insecticide concerned. In the third paper J M Barnes W J Hayes & K Kay discuss the risks inherent in the use of the organo phosphorus insecticides describe the signs and symptoms of poisoning and suggest ways in which the health hazards likely to arise might be controlled.

The importance of standardizing tests for measuring susceptibility or resistance to insecticides needs to be stressed. Several different techniques which have recently been developed for determining resistance in mosquito larvae are compared and evaluated by A W A Brown in a short note in which the desirable characteristics of a standard test are also summarized.

As to the mechanism of insecticide resistance there are two factors of special interest to research workers the degree of resistance acquired and the mode of inheritance. J R Busvine contributes two concise critiques of laboratory work on this subject—the first relating to the housefly and the second to *Drosophila*.

It is extremely important that the authorities responsible for carrying out vector control programmes with residual insecticides should be able to find out readily whether the area sprayed has been completely covered by the insecticide and whether the deposit has remained effective since the last cycle of operations. This is particularly necessary in areas where the houses have mud walls on which adsorption of the insecticide may

take place. In the note by E Paulini & S Roubaud Reis a new and simple colorimetric method for estimating DDT and BHC deposits on sprayed surfaces in the field is described.

The unreliability of some of the components of spraying apparatus is a frequent source of trouble during vector-control campaigns. Often such parts as nozzles and pressure gauges become defective after a relatively short period of use in the field and this results in decreased efficiency and increased costs of operation. Two notes by F W Knip describe some investigations which have been carried out in India on spraying apparatus components. In the first, the results of durability experiments on nozzle tips of different materials are presented. These results are encouraging; tips of the plastic material polyethylene were found to be as resistant to erosion as those of stainless steel and have the advantage of being considerably cheaper to produce. In the second note the author discusses the common causes of failure of pressure regulators and gauges and suggests some ways in which their efficiency might be improved.

The effective dispersal of aerosols or solid particles of insecticides is one of the most pressing questions in a number of vector control campaigns. At the present time several methods for ensuring the satisfactory dissemination of particles of insecticide are available but for technical or economic reasons few of them are universally applicable. The brief note by T C Helvey however describes two simple and inexpensive devices which can be used to distribute insecticides over all types of terrain—closely planted crops hillsides and unapproachable gorges as well as rows of tall trees.

The control of body lice is at present almost entirely dependent on residual insecticides but the apparatus normally available for dusting these materials over bedding and clothing is frequently unsatisfactory. This has led to extensive research on the design of dusting apparatus and in the last note in this issue S H Fryer describes a new



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## HYGIENE AND PUBLIC HEALTH TEACHING IN EUROPE

(Corrigendum)

The table entitled *Hygiene and Public Health Teaching in Nineteen European Countries* published in the February number of the *Chronicle* (Vol 11 No 2 pp 28 30) contains several errors concerning various countries. For instance it would seem from the table that social medicine and occupational health are not taught in France. In fact all medical faculties in France include hygiene preventive medicine social medicine and occupational health in their teaching programmes. Two certificates are granted

(a) a certificate in hygiene and health welfare work for students intending to enter the public health services and

(b) a certificate in occupational health and industrial hygiene for future industrial physicians.

In other cases apparent errors may be explained by the fact that certain professorial chairs are not always given titles indicating all the subjects they cover. The chair of hygiene for example sometimes entails giving courses in social and preventive medicine.

Since the table does not give an exact picture of the situation in some countries and in order to avoid any mistaken interpretation the reader is referred to the monograph entitled *The Teaching of Hygiene and Public Health in Europe* by F Grundy and J M Mackintosh (*World Health Organization Monograph Series* No 34).

# THE WORK OF WHO 1956

## A Review of the Annual Report of the Director General

In the Annual Report of the Director General on the work of the World Health Organization in 1956<sup>1</sup> which is a comprehensive account of the year's accomplishments particular emphasis is laid on the eradication of certain communicable diseases—especially malaria—on WHO's role in the development of national health services and on the "catalytic effect" on national health administrations of the research stimulated promoted or coordinated by the Organization.

The goal of malaria eradication was set by the Eighth World Health Assembly and one of WHO's principal concerns in 1956 was further to clarify the ways in which it could most effectively assist governments to that goal. The success of many eradication programmes in the different regions may well depend on the guidance and help WHO is able to provide. Public health techniques are available for the eradication of the endemic treponematoses and smallpox as well and eradication programmes for these diseases are under way in various parts of the world.

In assisting the development of public health services WHO is paying increasing attention to the integration of services which might at first sight appear dissimilar or unrelated but which in fact have many points of contact. Joint programmes—in nutrition maternal and child health and health education for example—are being more frequently undertaken and the benefits to be derived from them are becoming more widely recognized.

It is of course not only through its stimulation and co-ordination of research that WHO exerts a catalytic effect on health work and on national health administrations but the research activities of the Organization provide a good illustration of this effect. As the Annual Report puts it the promotion of research is one of the keystones of WHO's future work and an essential element in one of the Organization's basic functions which is the pooling and appraisal of scientific and technical knowledge and the study of its applicability to public health problems. The planning and co-ordination of research gives rise to a stimulating "cross fertilization" of ideas and experience has shown that the formulation of sound research programmes evokes increased co-operation and more energetic measures from both individuals and institutions.

The effects of research in which WHO has played a part are felt in a large number of the projects in operation in 1956. A complete list of these projects is given in the Annual Report constituting a guide to every type of aid provided by the Organization in its efforts to promote better health in all parts of the world.

In addition to giving information on the established pattern of work which has continued throughout 1956 the Annual Report also makes reference to the responsibilities of WHO in a new and challenging field of public health—the peaceful uses of atomic energy. Although the work remains limited in scope a sound basis now exists for the activities which the Organization will certainly be required to carry out in the future.

<sup>1</sup> World Health Organization (1957) *The work of WHO 1956 annual report of the Director-General*. The World Health Organization, Geneva. xi+33 pages. Price 10 \$...00 or 5 fr. 60. Published in English, French, and Spanish.



## SCHEDULE OF MEETINGS

8-13 April	Expert Committee on Yellow Fever Vaccine	Geneva
25 April-3 May	Seminar on Mental Health of the Sub-Normal Child	Oslo
25 April-4 May	Joint WHO/ILO Seminar on the Nurse in Industry	London
7-25 May	Tenth World Health Assembly	Geneva
27-31 May *	Twentieth session of the Executive Board	Geneva
12-15 June	Sub-Committee on Non-Proprietary Names of the Expert Committee of the International Pharmacopoeia	Geneva
17-24 June	FAO/WHO Expert Committee on Food Additives	Geneva
24-28 June *	Study Group on Histological definitions of cancer types	Oslo
27 June-5 July	Conference on Health Education of the Public	Wiesbaden
15-20 July	Expert Committee on Poliomyelitis	Geneva
25-31 July	Technical Conference on Insect Resistance	

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Approximate dates

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

studies it became clear that case finding was not sufficient and that contacts must also be treated because they produced a reservoir of infection which would vitiate the results of a mass campaign. Further unless the search for cases was carried out methodically house by house and family by family cases would be missed and sooner or later the infection would again spread. The development of long acting penicillin preparations and attention to these principles have been shown to make it possible virtually to eradicate these diseases. " Nevertheless despite the success with penicillin treatment " serious and sometimes fatal hypersensitivity reactions following penicillin therapy have been reported in some countries during the last few years. An inquiry by WHO into the frequency of such reactions suggests that the incidence is not high but may be increasing. In the endemic treponematoses mass campaigns there has been little or no evidence of these reactions probably because the campaigns have mainly involved rural populations in under-developed areas and especially children not previously exposed to the antibiotics. In urban populations in the same areas on the other hand, where penicillin is used in adult syphilis and other infectious conditions serious penicillin reactions have been reported. WHO is therefore co-ordinating research in the laboratory and in the field on the usefulness of penicillin preparations other than PAM and antibiotics other than penicillin as public-health weapons against the treponematoses. Efforts are being made to obtain more precise knowledge of the transmission factors and the epidemiological cycle of the endemic treponematoses which may facilitate the establishment of simple barriers against infection "

Dangers inherent in the relaxation of routine surveillance after programmes against venereal syphilis were noted in national reports received by WHO during the year. These showed that where there is relaxation in surveillance " an increase in the incidence of early syphilis may be expected " What must also be taken into account is that even in the more developed

countries venereal infections cannot be regarded as eliminated so long as important reservoirs of these infections remain in other parts of the world where preventive measures are inadequate. This latter topic was discussed among others at the International Symposium on Venereal Diseases and the Treponematoses which was organized jointly by the United States Public Health Service and WHO. The symposium was held in Washington D C in May 1956 and some 500 medical officers from all WHO Regions participated in it.

The WHO Reference Laboratories at Copenhagen and Chamblee Ga continued the co-ordination of research into laboratory methods for serum diagnosis of the treponematoses including research on the use of the more recent treponemal antigens (*Treponema pallidum* immobilization (TPI) and *Treponema pallidum* agglutination (TPA) tests). Participating in these studies were some 30 laboratories in various parts of the world. Co-operation with the International Treponematoses Laboratory Center at Johns Hopkins University Baltimore Md was continued. Combined efforts were made to elucidate the biology of the treponematoses and a monograph reviewing the Center's investigations on this subject over the last five years was prepared for publication<sup>1</sup>.

### Smallpox

It is now possible to eradicate smallpox from a country by using a new stable vaccine produced as a consequence of studies promoted by WHO. Reports on the vaccine have been submitted to the Expert Committee on Biological Standardization for consideration in establishing an international standard. Continuing work on the most stable vaccine showed that after two years exposure at 45 C it still gave 100% successful vaccinations in man.

It had been known for a long time that eradication of smallpox was possible by

<sup>1</sup> T. J. B. A. Hoffmiller, D. H. (1957) *Biology of the Treponematoses*. Geneva (World Health Organization Monograph Series N. 35).

## COMMUNICABLE DISEASES

The year 1956 brought the work of WHO on communicable diseases to a point where past activities could be viewed in perspective and it became possible to look into the future with the hope that by using similar methods of approach results could be attained in the fight against many communicable diseases as important as those achieved in malaria and endemic treponematoses

Three of the communicable diseases—malaria, treponematoses and smallpox—single themselves out for immediate mention by reason of the fact that techniques of eradication are now available for all of them

### Malaria

Two factors have influenced WHO's work in this field over the past year: the increasingly general acceptance of the policy of eradication as advocated by the World Health Assembly and the development of insecticide resistance by certain malaria vectors. These two factors are interdependent. The development of resistance to the insecticides by the vector has made eradication imperative. In the last eight years the work accomplished with the help of the Organization has shown that if transmission is interrupted for a sufficient length of time by breaking the cycle at the level of the vector over a wide enough area the infection dies out and costly control measures can be replaced by the much cheaper routine supervision. As is well known the systematic application of residual insecticides made such interruption of transmission possible.

The policy of replacing routine malaria control by malaria eradication was considered technically justifiable by meetings attended by malariologists from many parts of the world and convened during 1956. Their views and the fact that many governments had accepted the policy gave cause for encouragement. Although failures had

occurred the Inter regional Malaria Conference for the Eastern Mediterranean and European Regions believed that these were more likely due to lack of preparation or administrative faults than to technical reasons. Financial limitations also prevented some eradication programmes from being launched and in this connexion it is stressed that the Eighth World Health Assembly indicated the solution to such situations by establishing the Malaria Eradication Special Account. Unfortunately the Account has received very little support so far and the meagre funds available are quite inadequate for the purpose.

In collaboration with the United States Public Health Service National Institutes of Health WHO made an experimental study of the efficacy of either pyrimethamine or chloroquin mixed with common salt added to the diet as a protection against malaria infection. A number of laboratories in different parts of the world collaborated in the study of insecticide resistance in anophelines and this problem was also studied by the Expert Committee on Insecticides.

WHO personnel were engaged in anti malaria work in 34 areas in all WHO Regions. New projects were under way in Ethiopia and Sudan. WHO malaria consultants were sent at government request to many countries and territories and three advisory teams were working in the field.

### Treponematoses and venereal infections

In the mass campaigns carried out against endemic syphilis and yaws with assistance from WHO and UNICEF more than 55 million people had been examined and 16 million treated by the end of 1956. Indeed these endemic treponematoses were the first group of diseases to be controlled by case finding and treatment. But eradication as opposed to control only became possible when in the course of WHO assisted field



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means of preventive vaccination. Nevertheless the disease had persisted in many parts of the world. This was caused primarily by the fact that the usual lymph—the vaccine in general use—rapidly lost its potency in high temperatures and although more stable dried vaccines had been tried results were often unsatisfactory. In consequence of the development of the new vaccine which is stable for months in tropical temperatures eradication programmes have started in some countries particularly in Latin America.

### Zoonoses and veterinary public health

In many under developed areas brucellosis causes much human sickness and also leads to heavy economic losses in animals and animal products. The control of this disease in sheep and goats is a most important public health problem to which the Organization has given considerable attention. Studies which had been carried out on vaccines and the diagnosis of brucellosis in sheep and goats were discussed in October at a meeting attended by representatives of WHO, FAO, the Department of Bacteriology of the University of California and the directors of the FOA/WHO Brucellosis Centres in Tunis, Weybridge (England) and Montpellier (France).

In the past year WHO has given assistance to several brucellosis laboratories concerned *inter alia* with diagnostic and chemotherapeutic studies in human beings.

The prospects for rabies control have been considerably improved by certain advances stemming directly from research promoted by the Organization which has followed two main approaches—the first being to diminish the chances of human infection by immunizing and controlling domestic animals particularly dogs and the second to develop better treatment methods. One important advance was the demonstration that the use of hyperimmune serum had a major effect in reducing mortality even after severe bites by rabid wolves. Work is continuing in order to determine the proper dosage and

the effect of vaccination in combination with the serum.

WHO gave assistance to the Institut Pasteur in Novi Sad Yugoslavia for research on rabies in wild animals including bats and work was continued on the development of methods of pre exposure protection for persons who by their occupation run a severe risk of exposure to rabies.

During the year WHO/FAO Reference Leptospirosis Laboratories were designated in Australia, Japan, the Netherlands, the United Kingdom and the United States of America. The centres will assist national and other leptospirosis laboratories in carrying out diagnostic procedures, identifying *Leptospira* strains, making surveys in man and animals and training laboratory workers.

### Tuberculosis

Work on tuberculosis has continued along similar lines to those of previous years.<sup>2</sup> In addition the Organization has extended its studies on diagnostic and control procedures that might usefully be adopted for antituberculosis programmes under primitive conditions. Field research into these problems was planned and co-ordinated by the WHO Tuberculosis Research Office in Copenhagen.

Despite mass BCG vaccination and the considerable progress which has been made in other aspects of tuberculosis control in recent years the disease remains a serious world problem. The Annual Report analyses the limitations of BCG vaccination in the following terms: BCG has been and is being widely used in joint WHO/UNICEF projects. Recent reports confirm that the principles on which its use is based are sound and that BCG vaccination has a real effect in reducing the incidence of tuberculosis including the adult type of infectious pulmonary disease. When correctly and widely applied it will eventually reduce the reservoir of infection in a population but it is not in itself sufficient to influence the main reservoir of infection which is in already infected persons and to bring tuberculosis under

control. It must be combined with a programme of case finding and treatment."

As the Report goes on to say "The use of drugs in ambulant persons for therapeutic or prophylactic purposes as a public health measure has therefore been carefully studied. The control of tuberculosis in vast areas of the world may well depend eventually on the widespread use of one or more cheap drugs that will be easy to produce, to distribute and to take that will be effective yet non-toxic." No product has yet been found or at least none is yet readily available which meets all these requirements but isoniazid can be considered the first which does meet some of them. However in quite a high proportion of cases it has been shown that its effectiveness may be limited by resistance in *M. tuberculosis*. This resistance is less frequent if isoniazid is used in combination with PAS (para-aminosalicylic acid) or streptomycin but this combined treatment is prejudiced by high costs and the addition of PAS often causes undesirable side effects. WHO has continued to sponsor the use of isoniazid alone in field studies because it is the only cheap antituberculosis drug now available, it is easy to distribute and it is readily taken. The Organization continues with the study of various techniques which may prove applicable to particular local conditions so that when more effective products become available control of tuberculosis will be brought within the reach of all countries as quickly as possible.

### **Poliomyelitis**

Dramatic progress has been made in recent years in the development of a vaccine against poliomyelitis and in the possibility of controlling the disease. More than a hundred million doses of the vaccine have been administered with no recurrence of the unfortunate incident of 1955 and the experience gained has shown that vaccination can be effective in reducing the serious consequences of infection. There is however still too little knowledge on the part thus vaccine should play in controlling the disease

and the question whether it can safely be used during an epidemic is still not finally settled. Intensive study will be required before it can be definitely established whether the present vaccine or the living attenuated virus vaccines on which intensive work is being done will provide the solution to these problems. Meanwhile WHO is co-ordinating research and the WHO regional poliomyelitis laboratories have continued to assist national laboratories in studying prevalent viruses and undertaking or assisting in serological surveys.

### **Trachoma**

Interesting new developments in regard to the treatment of trachoma have resulted from studies in Taiwan and Morocco which were assisted by WHO and UNICEF. Where before it was thought that local treatment with antibiotics required repeated applications several times daily over a period of months, it has since become clear that

both the frequency and duration of treatment can be reduced with a corresponding reduction in cost and that suitable training of school teachers and others can make mass treatment a practical proposition. To bring about needed improvements of current methods WHO is promoting epidemiological, virological and therapeutic studies, especially investigations of the associated conjunctivitis which have been shown to play an important part in the evolution of the disease. Trachoma control has now reached a stage more or less comparable to that attained when crystalline penicillin was used against the treponematoses—before the long acting repository preparations became available. Some of the problems in controlling both diseases are rather similar and their solution in the case of the treponematoses improves the prospect of their solution in trachoma control as well.

### **Leprosy**

The experience gained and the lessons learned by WHO in the years of study of the treponemal diseases and tuberculosis have

MASS CAMPAIGN AGAINST YAWS  
IN NIGERIA



*Before treatment the boy's face is covered with many infectious lesions (1). He receives a single dose of long-acting penicillin (2) and seven days later (3) all the lesions can be seen to have died (3).*

established technique to different conditions requires careful pilot studies if success is to be ensured. Furthermore health authorities need to know what results are likely to be achieved in return for the money and effort expended.

"The successful mass application of a communicable disease control measure may have a large effect on the health services of the country. Many people particularly in rural areas are brought into contact with preventive and curative services for the first time and a demand is created for further services. This requires a broadening of the programme especially during its consolidation phase to include measures against other

diseases and this should lead to strengthening of the local health services. The planned use of communicable disease control to this end is being increasingly emphasized by WHO and the most effective ways of doing so are being studied.

"Behind all this work there is a fundamental technique without which progress would at best be very slow—the technique of co-ordination of research. Public health problems are so numerous and facilities for research so limited that unless the work of the different laboratories and institutions is co-ordinated and co-operative studies planned unnecessary repetition will greatly delay progress."

## PUBLIC HEALTH SERVICES

The general policy of WHO in relation to public health services is well illustrated by the following excerpt from the Annual Report.

"WHO's work on the organization of public health services is being governed increasingly by the concept of integrated services as distinct from services separately provided in specific limited fields. Viewed in this light services which at first sight appear dissimilar or unrelated are seen to have many points of contact and thus to lend themselves to the integrated approach. Joint undertakings—for example in nutrition, maternal and child health and health education—are becoming more common and the benefits that accrue from them more widely recognized. The concept itself is being broadened and much attention is being given to social or cultural anthropology and the study of human relationships within the community. The time may not be far off when such subjects will in turn be integrated in the comprehensive health service."

"As the work develops more emphasis is being placed on the long-term study of important health problems of world-wide significance. Such studies were planned or in progress during the year on a variety of subjects including the role of the community

psychiatric hospital, protein deficiency, the anaemias of pregnancy, the teaching of paediatrics, administrative practices in nursing and the cost of medical services."

### Public health administration

The continuation of work designed to assist governments in establishing decentralized integrated health services initially for a district or province but ultimately covering the whole country constituted an important part of WHO's work in public health administration in 1956. Experience had shown that "isolated health projects are of doubtful and transient value unless in the country concerned they are based on a structure of decentralized integrated health services in which curative and preventive services are organized in hospitals, laboratories and health units well distributed in the cities, towns and villages. These services must be supported by the population and guided by a competent central health authority."

Examples of WHO-assisted pilot projects designed to bring this about were the development of comprehensive health services in the State of Guanajuato, Mexico and the expansion of provincial health care in the



been made use of and applied in WHO's leprosy control programmes. Prospects for more effective control of this disease have improved following the discovery of the effectiveness of the sulfone drugs against leprosy. But many problems remain to be solved. They include the determination of the optimum drug preparation, the development of simple case finding methods and diagnostic techniques, the establishment of criteria of infectivity and the need to overcome the centuries old fear of the disease. WHO is developing its leprosy programmes with these objects in view.

### Bilharziasis

During 1956 WHO continued to stimulate and encourage research on the identification of intermediate snail hosts and the ecology of the vectors. A detailed knowledge of the ecological factors influencing snail life is essential for the control of the disease by molluscocides or in attempts to prevent its spread in irrigated areas. A group of specialists concentrated on these problems and recommended guiding lines for the necessary ecological studies. WHO consultants made surveys on the distribution and the socio-economic importance of the disease in Africa and recommended methods of control.

### Plague

Work on the epidemiology of wild rodent plague—which has been carried on with WHO assistance for the past three years in Iran, Iraq, Syria and Turkey—has now been completed. The work plan which included study of the forms of sylvatic plague prevalent in the four countries has been described in previous Annual Reports.<sup>3</sup> Two important results of this inter regional operation have been the organization in the four countries of specialist teams for identifying and controlling outbreaks of plague arising from the areas of endemicity of wild rodent plague and confirmation of the total absence of species of *Rattus* in the area and the

identification of the small burrowing gerbils of the genus *Meriones* as the most important reservoir.

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Studies carried out by the Organization on the communicable diseases have a similar basic approach. The Annual Report shows how each problem is being attacked with analogous methods whatever the disease may be. The methods of approach adopted in nearly all these studies [on the communicable diseases] follow a similar pattern which has been developed from experience. At first sight it may seem surprising that the initial steps are often concerned with classification and nomenclature, but it has been found that there may be wide differences of opinion in different parts of the world as to the meaning of a technical term. A further step is to develop standards of measurement and methods of using them so that the results of workers in different countries may be compared and interpreted.

When these and similar basic terms are available their application in epidemiology and other studies follows. Wide experience of survey techniques in WHO's programmes in malaria, tuberculosis and the treponematoses has shown that valid results can only be ensured by the most careful planning and attention to statistical requirements; otherwise subsequent evaluation becomes impossible. These principles are now being applied in surveys for various virus diseases including poliomyelitis. A properly designed survey is expensive and demands highly trained staff that are not easy to find. It has indeed often been found necessary to arrange for special training in the techniques required. A broader approach is therefore being developed which it is hoped will prove both more efficient and more economical. By this method it may be possible to determine the prevalence and distribution of several communicable diseases at the same time at relatively little additional cost.

"Experience in WHO's earlier programmes has shown that the application of a new control measure or the adaptation of an

from a community to provide comprehensive health care

Where rapid industrialization and economic development are changing the life and working conditions of the people occupational health is assuming ever increasing importance. To avoid mistakes similar to those which were made in the mid nineteenth century in countries then undergoing rapid economic expansion WHO is promoting the establishment of institutes of occupational health attached if possible to a school of public health or to a university which will provide the necessary scientific background to ensure confidence of the groups concerned in the action carried out by the institute. The first of these institutes will be established with WHO assistance in Egypt as part of the High Institute of Public Health at Alexandria. Plans are being made for similar work to be carried out in the South East Asia Region.

A survey was made in Turkey during the course of the year by WHO and ILO preparatory to the drafting of plans for a project on occupational health services. Another survey was carried out by WHO at the request of and in co-operation with the Universal Postal Union on occupational diseases of postal workers.

Further help was given by WHO in planning and organizing rehabilitation services in Austria, Greece, Spain, Yugoslavia and Lebanon. Pakistan was assisted in strengthening the training of physiotherapists by improving the existing rehabilitation service and establishing a school of physiotherapy.

#### Health education of the public

Health authorities in 18 countries and territories received assistance from WHO in reviewing needs and resources for educational work with the public and in strengthening their health education services. In Burma, Ceylon, Libya and Paraguay WHO consultants on health education continued to serve with the national health ministries. Courses for medical officers and public health workers were organized with WHO

help in Burma and Ceylon. A comprehensive study of educational aspects of the health services in several of the islands and territories of the Pacific was made at the request of the South Pacific Commission by the regional adviser in health education of the Western Pacific Region.

To help governments meet the growing demands for trained health educators WHO has increased the number of fellowships granted for that purpose. In study courses for all types of public health workers particular emphasis was placed on the principles and practice of health education of the public. WHO also co-operated in the further development of post basic training courses at institutes and schools of public health. As an example WHO seconded a full time lecturer to serve on the faculty of the School of Public Health at the American University at Beirut. In the Philippines the Organization's regional adviser helped the Institute of Hygiene to plan and develop training in health education for medical officers, nurses, health educators and others. In addition WHO gave assistance to national and provincial authorities in several countries in the planning and organization of in service training in health education.

During the year work started on a study of training in health education and a study on health education for teachers was begun in co-operation with UNESCO.

#### Maternal and child health

The anaemias of pregnancy, diarrhoea and enteritis in infants, training methods for health workers and methods of obtaining morbidity data are some of the important questions connected with maternal and child health on which WHO has planned studies. The anaemias of pregnancy for example are an important cause of maternal mortality and morbidity in many areas. Not enough is known at present of their etiology, prevention and effective treatment to provide a basis for effective countermeasures and a study is therefore being planned which will cover both maternal and child care and nutrition.

Province of Kandahar Afghanistan The Government of the latter country also requested assistance from WHO in the preparation of a health Act which would provide for a complete systematic arrangement of decentralized health services In addition WHO has been asked to help in framing a second five year health plan in Sudan and to give assistance for surveys in Argentina and Colombia

In certain other countries where integrated health services have already been developed on the rural level further expansion has taken place An example of this is the Rural Health Centre in Jitra Kedah Federation of Malaya which is developing a curative and preventive service for the 60 000 people living in the local government area of Kubang Pasu Another example might be taken from Central America where the health demonstration area in El Salvador now in its sixth year of operation has made good progress by establishing a permanent decentralized system of health services Seven health centres and nine health sub centres (or medical posts) have been set up in some cases with assistance from the local inhabitants For non self governing territories WHO has suggested long term planning of health programmes in order to ensure orderly development of health services with special emphasis on prevention A review prepared by the Organization during 1956 summarizes the health conditions in each territory WHO has also submitted observations to the United Nations Trusteeship Council on the development of the health services in the trust territories

## Nursing

As a result of the technical discussions which took place during the Ninth World Health Assembly on *Nurses their education and their role in health progress* a number of countries have taken action to improve nursing services and nursing education An indication of the widespread interest aroused by these discussions is to be found in the fact that twenty one countries included nursing

representatives in their delegations to the Health Assembly This was indeed the first occasion on which doctors health administrators and nurses from all parts of the world were able to consider together the problems of nursing

Training in basic nursing midwifery and auxiliary nursing continued to receive WHO help To meet the changing needs of expanding health services some current programmes were modified and fewer programmes of assistance were started although those already in operation were strengthened notably in Sudan and Malaya WHO nurses in the field during the year numbered 191 in 43 countries In order to prepare nurses for administrative and supervisory positions basic programmes were extended to include post basic training More emphasis was given to the part played by the nurse in planning and developing health programmes and in several countries WHO nurses assisted on the administrative level in creating or expanding nursing services Refresher courses and in service education continued to be an important part of the general programme In some programmes—for instance that for extending nursing training in a group of Bombay hospitals—the objective of preparing local nurses to carry the full responsibility for continuing the work has been achieved and the international nurses have been withdrawn

WHO made available a consultant in psychiatric nursing to five countries in the South East Asia and Western Pacific Regions in order to meet the urgent need for a psychiatric nursing service in those countries Acting on a recommendation made by the Expert Committee on Nursing WHO prepared a draft manual on nursing service administration which was submitted to nursing administrators for comment

## Social and occupational health

In 1956 WHO began a study with ILO assistance on the cost and financing of medical care services This was intended as a preliminary step in a long term plan designed to assess what economic effort is required

rich in protein. Protein rich foods are available in adequate amounts almost everywhere but the means by which they can be processed or used in combination with other foods to serve as an adequate diet for the young child require further investigation." This problem has been of considerable concern to WHO and as a result of a meeting of leading authorities on child nutrition which was held in 1955 a small group drawn from the members of the Expert Advisory Panel on Nutrition was formed to advise the Organization in this specialized field. This group held two meetings during 1956 and representatives of UNICEF, FAO and WHO attended. Satisfactory agreement was reached on future work and the Rockefeller Foundation set aside a sum of \$250,000 for further research. These activities led to programmes for the investigation and use of sesame seed press cake and peanut press cake and work on a number of other foods is now being planned. This work is being carried out in co-operation with public health research laboratories in various countries.

WHO has made grants to nutrition research centres in India, Uganda and Guatemala and considerable advances have resulted from the work undertaken. In India extensive investigations have been carried out with various mixtures of readily available local foodstuffs and this research programme has now become part of a large well planned scheme for the prevention of malnutrition. In Uganda and Guatemala mixtures of inexpensive local foodstuffs have been developed which can apparently maintain satisfactory growth and therefore offer hope for the development of preventive programmes. In the course of the work in Uganda it was found that vegetable oils, unlike animal fats, are well tolerated by protein deficient children. This is an important finding because it allows a calorie rich diet to be used for the treatment of young children in place of the diet with low calorie content which has had to be used hitherto.

The nutritional anaemias which, as the Annual Report points out, "are a serious

public health problem in many parts of the world" were the subject of WHO surveys in India and Mauritius in 1955. Morbidity and mortality due to nutritional anaemias are high in Mauritius and at the Government's request a haematologist was sent by WHO in 1956 to help in clarifying their etiology. He will shortly be joined by a nutritionist.

Advice and assistance from WHO were requested from many countries which are rapidly expanding their health services and wish to integrate nutrition programmes into their public health work. The Report points out that, in order to achieve this much fuller use could be made than has hitherto been the case of the facilities for preventing malnutrition that are available through maternal and child health and other services.

#### Dental health

A dental health officer was appointed to the staff of WHO in 1956 and the general lines of the Organization's dental programme were laid down. Consultants in dental health were also provided for Hong Kong, India and the Philippines.

#### Health work among Palestine refugees

WHO has continued to assist in the health care of some 900,000 Palestine refugees residing in Lebanon, Syria, Jordan and in the Gaza area. About 44% of these refugees live in 58 camps and the remainder reside in towns and villages. A variety of health services are provided by the United Nations Relief and Works Agency (UNRWA) including sanitation, dental health, housing and supplementary feeding services. WHO, in addition to providing a public health administrator, a malariologist, a public health engineer, a health educator and part time consultants as in 1955, also recruited a public health nurse in 1956 to supervise the nursing work. The total number of health workers employed in the service on 30 June 1956 was 3368 of which 19 were internationally recruited, the rest locally recruited from among the Palestine refugees.

Another study on diarrhoea and enteritis—the leading cause of death among infants and children in most countries of the world—will include the epidemiological, bacteriological and sanitation aspects as well as those connected with feeding and child care methods

The trend towards the integration of health programmes for mothers and children into the general framework of health services has become more pronounced during the year. Many maternal and child health programmes in Latin America and in particular those in Colombia, Ecuador and Peru provide good examples of this tendency. In the Philippines and Taiwan maternal and child health activities are now part of the more comprehensive work of rural health units. In the Eastern Mediterranean Region the Calicut Health Demonstration Area includes a comprehensive maternal and child health programme. The number of State wide public health programmes in India which include training in maternal and child health has now risen to 11. These as well as much of the maternal and child health work in other countries have been assisted jointly by WHO and UNICEF.

A WHO medical officer was assigned to Thailand as adviser to the Government on maternal and child health and a request for similar assistance was received from Indonesia. It is noteworthy that these are the first requests received by WHO for advisers in maternal and child health at the national level.

Paediatric education has been the subject of several surveys undertaken by WHO since 1952. The Western European survey made in co-operation with the International Paediatric Association was completed in 1956. A similar survey was carried out in the Americas also in 1956 and another was planned for South East Asia.

## Mental health

Increasing attention has been paid during 1956 to the development of community mental health services along the lines re-

commended in the third report of the Expert Committee on Mental Health<sup>4</sup>. One method of development is the improvement of facilities and extension of the scope of psychiatric hospitals to provide extra-mural treatment and other services for the community. An example of this type of development in its early stages is shown in Jordan where through WHO assistance facilities at the psychiatric hospital were modernized, mental health workers were trained and short courses on the principles of mental health work were arranged for general nurses.

As the shortage of trained mental health workers of all kinds remains acute WHO has provided a number of fellowships for study abroad and has helped in the improvement of national training facilities. This was done in Thailand for instance where training programmes in child psychology were started with the help of a WHO consultant. Another example of WHO participation in the extension of training programmes is to be found at the All India Institute of Mental Health where the Organization has helped in the establishment of a post graduate training programme in psychiatry and psychiatric nursing and of a research programme in psychiatry, neurology and neurosurgery. A WHO consultant in psychiatry and electrophysiology directed the setting up of electroencephalographic apparatus at the Institute and trained others in its use. Two psychiatric nurse consultants organized training courses at the Institute where they collaborated closely with the WHO psychiatrist. Other consultant advice has also been provided by the Organization for instance advice to the Government of Chile on developing a programme for treating alcoholics.

## Nutrition

"One of the most important causes of morbidity and mortality in large areas of the world is the absence of food suitable for the infant at the time of weaning and sufficiently

rich in protein. Protein rich foods are available in adequate amounts almost everywhere but the means by which they can be processed or used in combination with other foods to serve as an adequate diet for the young child require further investigation. This problem has been of considerable concern to WHO and as a result of a meeting of leading authorities on child nutrition which was held in 1955 a small group drawn from the members of the Expert Advisory Panel on Nutrition was formed to advise the Organization in this specialized field. This group held two meetings during 1956 and representatives of UNICEF, FAO and WHO attended. Satisfactory agreement was reached on future work and the Rockefeller Foundation set aside a sum of \$250 000 for further research. These activities led to programmes for the investigation and use of sesame seed press cake and peanut presscake and work on a number of other foods is now being planned. This work is being carried out in co-operation with public health research laboratories in various countries.

WHO has made grants to nutrition research centres in India, Uganda and Guatemala and considerable advances have resulted from the work undertaken. In India extensive investigations have been carried out with various mixtures of readily available local foodstuffs and this research programme has now become part of a large well planned scheme for the prevention of malnutrition. In Uganda and Guatemala mixtures of inexpensive local foodstuffs have been developed which can apparently maintain satisfactory growth and therefore offer hope for the development of preventive programmes. In the course of the work in Uganda it was found that vegetable oils, unlike animal fats, are well tolerated by protein-deficient children. This is an important finding because it allows a calorie-rich diet to be used for the treatment of young children in place of the diet with low calorie content which has had to be used hitherto.

The nutritional anaemias, which as the Annual Report points out, are a serious

public health problem in many parts of the world, were the subject of WHO surveys in India and Mauritius in 1955. Morbidity and mortality due to nutritional anaemias are high in Mauritius and at the Government's request a haematologist was sent by WHO in 1956 to help in clarifying their etiology. He will shortly be joined by a nutritionist.

Advice and assistance from WHO were requested from many countries which are rapidly expanding their health services and wish to integrate nutrition programmes into their public health work. The Report points out that in order to achieve this much fuller use could be made than has hitherto been the case of the facilities for preventing malnutrition that are available through maternal and child health and other services.

#### Dental health

A dental health officer was appointed to the staff of WHO in 1956 and the general lines of the Organization's dental programme were laid down. Consultants in dental health were also provided for Hong Kong, India and the Philippines.

#### Health work among Palestine refugees

WHO has continued to assist in the health care of some 900 000 Palestine refugees residing in Lebanon, Syria, Jordan and in the Gaza area. About 44% of these refugees live in 58 camps and the remainder reside in towns and villages. A variety of health services are provided by the United Nations Relief and Works Agency (UNRWA), including sanitation, dental health, housing and supplementary feeding services. WHO, in addition to providing a public health administrator, a malariologist, a public health engineer, a health educator and part-time consultants, as in 1955, also recruited a public health nurse in 1956 to supervise the nursing work. The total number of health workers employed in the service on 30 June 1956 was 3368, of which 19 were internationally recruited, the rest locally recruited from among the Palestine refugees.

The general health of the refugees remained good throughout the year. There were no cases of any of the quarantinable diseases. All the 43 cases of relapsing fever reported were tick borne. Prophylactic inoculations and the provision of safe water supplies contributed to a further decrease in morbidity resulting from enteric diseases. As in previous years dysentery and eye diseases continued to be the most common infections particularly during the summer months.

The attendance for the year at the maternal and child health centres amounted to 120 000 and at the infant health centres to almost half a million. Both these figures are considerably above those for previous years. The number of clinical malaria cases dropped by

nearly 50% as a result of malaria control measures.

Assistance in tuberculosis control was given by a WHO consultant from the Eastern Mediterranean Regional Office. A registration system was introduced which ensured the regular surveillance and continued treatment of patients and the tracing of contacts.

Further improvements were made in environmental sanitation and new camps with good shelter standards were opened. Successful health and education work has meant that those refugees living in camps now have cleaner surroundings and they have co-operated much better in the health services made available.

## ENVIRONMENTAL SANITATION

One important aspect of the work carried out in this field during 1956 was that concerned with the development of insect resistance to insecticides. The development of resistance is a fact which is now generally recognized to be of vital public health importance. A determined effort has therefore been made by the Organization to co-ordinate research on the subject including research on the biochemical and physiological bases of resistance about which information is still incomplete. WHO completed a world wide survey which covered some 100 laboratories working on insect resistance and the results of this survey were sent to the Expert Advisory Panel on Insecticides for comment.

WHO established contact with all laboratories working on resistance to insecticides and on the basis of information supplied by them and other sources produced a circular which is despatched every other month to some 200 research workers. Other activities carried out by the Organization included the development of standard methods for testing resistance in adult mosquitos and mosquito larvae and encouragement of their routine use. Analysis and publication of the results of a world wide test on the resistance of body lice to insecticides and the despatch

of a WHO consultant to Africa in order to make a first hand examination of resistance of body lice to DDT and BHC in certain areas.

The toxic hazards of the new pesticides were considered by a WHO study group in which FAO and ILO collaborated. As well as outlining protective measures for operators handling these pesticides the group gave attention to the type of information required for a full understanding of toxic hazards. Conjointly with the stimulation of tests with new insecticides WHO is gathering information on their possible toxic effects.

In collaboration with the Tropical Testine Establishment of the Nigerian Government at Port Harcourt WHO resumed experiments on the effects of tropical storage on the physical characteristics of insecticide formulations. This work will continue in 1957.

During 1956 WHO devoted special attention to the following particular aspects of environmental sanitation: the development of administrative organizations; improvement of rural sanitation; training of sanitation personnel; and dissemination of information.

Demonstration and training programmes in environmental sanitation arranged with WHO assistance were enlarged. The training

side of rural sanitation projects such as those undertaken during the year in Burma and Indonesia was given particular attention. Because many local health departments lack qualified sanitary engineers WHO has either given assistance in the organization of special short training courses or else has helped in developing regular courses in existing institutions. Short courses were organized in collaboration with the Danish and Swedish Governments and sanitary engineering courses were initiated at the Engineering School in Iraq.

WHO gave advice on public health engineering to a number of provincial and central

health administrations interested in developing or reorganizing their sanitation services. Stress was laid on the integration of sanitation into national plans for the general improvement of public health services.

Other studies which were actively pursued during the year were those on the establishment of international standards of drinking water quality and standard methods of water examination, milk hygiene (in collaboration with FAO and UNICEF), the relationship between irrigation engineering and the spread of bilharziasis and in collaboration with the United Nations community development and the utilization of water resources.

## EDUCATION AND TRAINING

The Annual Report summarizes the basic objectives of the Organization in this sphere in the following terms: "to enlarge and strengthen local educational facilities to provide opportunity for further training abroad to encourage the continuation of study beyond the usual professional courses to promote better standards in professional education and training and to study events in the world wide field of education and training."

In addition to these objectives WHO continued to emphasize the importance of the preventive aspects of medicine and public health in all teaching programmes. For this reason assistance was given to medical schools to enable them to establish chairs of preventive medicine so that the subject could be better integrated into the undergraduate curriculum. However not all medical schools accept equal status for a chair of preventive medicine and in some countries although the principle may be accepted qualified teachers are not available. To meet this lack WHO has promoted a teacher training programme in preventive and social medicine.

To help medical schools adapt their curricula to meet the needs of foreign students WHO continued to grant fellowships to professors of schools of public health to enable

them to visit those countries whence substantial numbers of their students come and thus to acquire a better understanding of the conditions and problems in those countries.

It has been found that there is often a lack of clear ideas as to how the medical student can most effectively be made aware of the importance of the preventive aspects of the subjects he is required to study. Moreover the necessary emphasis on prevention can be given only if the teachers themselves are fully persuaded of its value. With this in mind WHO arranged consultations with physiologists from different parts of the world to prepare for a meeting of a study group on the concept of prevention in the teaching of physiology—one of the subjects in the pre-clinical curriculum which seems to lend itself best to the preventive approach. Conferences for professors of preventive medicine were also sponsored in Europe and in Central and South America.

The case of practising physicians who have part time public health duties but who lack training in preventive medicine is being actively studied by WHO. Their problem is one of some intricacy as "many of them cannot afford to leave their practices for the time needed for full training but in many parts of the world the practice of preventive medicine



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effect that the development of atomic energy has had on the medical sciences

Another study group met to examine the effect of radiation on human heredity. This question is of immediate concern to WHO as "the genetic as well as the possible somatic effects of low doses of radiation on large populations appear to be of considerable public health interest especially in connexion with the evaluation of the effects on health of radioactive waste disposal and of the large scale use of X rays in medicine." The

group made detailed suggestions for further research on radiation effects.<sup>6</sup>

During the year WHO awarded a number of fellowships some for attendance at an advanced course organized by the French Government on radiation protection others for the study of the problem of radioactive waste disposal and one for a study on the safe handling of radioisotopes

The report of the Study Group on the Effect of Radiation on Human Heredity together with the papers presented by various members of the Group will shortly be published by WHO

## EPIDEMIOLOGY AND HEALTH STATISTICS

### Health statistics

The importance of improving health statistics has been mentioned in previous Annual Reports and it is once again stressed in the Director General's Report to the Tenth World Health Assembly. The Report reveals that "reliable health statistics are available for the whole of only some 30 countries and for selected towns in a few others. Adequate statistics do not exist for most of the population of the world because of lack of physicians for diagnosis and of administrative machinery for recording. For the same reasons the statistics for the areas with the greatest health needs are insufficient to call attention to these needs. WHO must therefore help countries to set up or improve their health statistical machinery before it can use statistics in determining where its help can most effectively be used."

One of the more important tasks with which the Organization is concerned is the promotion and stimulation in economically under developed areas of methods designed to yield health information of sufficient accuracy to serve as a guide for health administrations. The National Committees on Vital and Health Statistics of which there are now 33 in various parts of the world could obviously play an important role in this work. WHO has also made contributions towards progress in this field with

advice on the grant of fellowships for health statistical training and by the dispatch of consultants to give assistance in the organization of statistical services. Seminars on vital and health statistics were also organized—one for instance in collaboration with the Government of Viet Nam and another jointly with the Commission for Technical Co-operation in Africa South of the Sahara. A number of the conclusions reached at the second of these and based on experience in various parts of Africa were seen to be applicable to under developed areas in other continents as well.

Apart from the normal continuation of work involved in the collection and publication of routine epidemiological data and vital statistics data on special subjects have been assembled and published in the *Epidemiological and Vital Statistics Report* to meet the particular needs of expert groups and committees or at the request of health administrations and research institutes. Certain special studies were also published in the *Bulletin*.

The application of statistical methods to WHO field projects and to the work of technical units has been carried on and the Annual Report makes mention of an outstanding example in Morocco. Here in the first field study of this kind on human beings statistical methods were used to ascertain the

is largely in their hands. The WHO Conference on the Public Health Training of General Practitioners which was held in October suggested certain educational and training methods which might prove suitable for such physicians.

Assistance to national teaching institutions has taken the form of assigning a teacher to initiate work, organize the teaching department and train others to carry on. This method has already proved effective and under the 1956 programme WHO visiting professors served a total of 335 months in 17 countries. Assistance was also given to Ethiopia, Libya, Nepal and Nigeria in the establishment and operation of schools for training auxiliary personnel in order to provide new health services.

As a further development of the evaluation made in 1955, a review was undertaken of the results of the fellowships programme

in the years 1947-52. Altogether 576 of the fellowships granted during that period were examined and the review showed that although the degree of success has differed in different countries, the results have in the main been satisfactory. Through such evaluations governments and WHO can obtain guidance on such factors as the selection of candidates, the training of fellows and the use made of them on their return to their own countries. In addition, 883 fellowships were awarded between 1 December 1955 and 30 November 1956.

Other work carried out under the education and training programme during the past year included the compilation of an annotated bibliography on medical education for the years 1946 to 1955 inclusive and commencement of work on a review of legislation governing medical education in different countries.

## ATOMIC ENERGY IN RELATION TO HEALTH

WHO's work in regard to the peaceful uses of atomic energy was placed on a sound basis in 1956. The Annual Report summarizes the aims of the WHO programme as follows: First and perhaps the most important to provide training; secondly to collect and distribute information on the medical problems of atomic energy and the medical uses of radioisotopes; thirdly to study the health problems involved in disposal of radioactive waste; fourthly to work with other international agencies for the distribution of radiation standards; to recommend codes of practice; and to recommend pharmaceutical specifications for the preparation of radioisotopes for medical use and fifthly to stimulate and co-ordinate research on the health aspects of radiation. The training programme will cater for the following three categories of workers: specialists (normally either physicians or health physicists) for protection work in atomic energy laboratories; public health administrators and sanitary engineers who are particularly interested

in such questions as the disposal of radioactive waste and the siting of reactors; and medical users of radioisotopes.

Recommendations on the general work of the Organization on the basis of the programme outlined above were made by the Study Group on Radiological Units and Radiological Protection convened by WHO at its meeting in April. In addition to recommending that WHO should continue and expand its consultative services to governments on radiological protection and the disposal of radioactive waste, the Group also proposed methods by which WHO could help in the problem of establishing adequate international facilities for standardization of X-rays and radioisotopes in collaboration with the International Commission on Radiological Units and Measurements.

The study group also made certain recommendations on training and on undergraduate and postgraduate education. In particular it felt that an attempt should be made to give medical students an idea of the

morphine like character. The Committee also gave more precise definitions of habit forming drugs. It felt that the barbiturates as habit forming and in some circumstances addiction producing drugs and the tranquilizing or ataractic agents as potentially habit forming drugs should be subjected to national control measures. The medical principles and methods for the treatment and rehabilitation of drug addicts were also outlined by a study group.

Apart from work directly concerned with drugs and pharmaceutical preparations the Organization also undertook certain other related activities. In some countries for instance a need has been felt for recommendations on simple but reliable laboratory methods for the diagnosis of various diseases and work has therefore been started on a manual incorporating such recommendations. A paper was published on the first of the

diseases to be considered—plague—and others are to follow.

Another new WHO activity concerns the public health aspects of food additives. In December the Joint FAO/WHO Expert Committee on Food Additives met and formulated general principles governing the use of non nutritive substances added to food to improve its flavour appearance texture or storage properties. The Committee concluded that while the use of such additives was justified for certain purposes it should not be permitted if for instance the additives disguised faulty processing or handling techniques deceived the consumer or substantially reduced the food's nutritive value. The Committee also agreed that each additive should be most carefully tested and that the decision to use it should be based on the judgement of properly qualified scientists.

## REGIONAL ACTIVITIES

Much of WHO's work in the field to which allusion has already been made is conducted by the six Regional Offices of the Organization. Although it is beyond the scope of this review to give a complete picture of all activities under way in each Region nevertheless some of the typical projects in operation during the year are mentioned in the following pages.

### AFRICAN REGION

Work in the Region during 1956 was concentrated primarily on problems of malaria, treponematoses, leprosy, tuberculosis and malnutrition. Efforts were again made to improve standards of nursing and health personnel.

Many leprosy control projects based on mass treatment with sulfones were in operation in the Region. Nigeria for example had an extensive treatment scheme and in French Equatorial Africa the Government aided by WHO and UNICEF embarked on a campaign which is now being

intensified. Of the 150 000 leprosy patients in the territory more than 100 000 are now receiving regular treatment. Leprosy control activities of various types were also under way in French West Africa, Uganda and Gambia.

Campaigns against yaws jointly assisted by UNICEF and WHO are in operation or being planned in many parts of Africa including Liberia, Sierra Leone, Gold Coast, Togo (French Trusteeship), Togoland (British Trusteeship) and the Federation of Nigeria. Stimulated by these campaigns certain communities in Nigeria have themselves provided funds for further medical help and for setting up rural health centres. Campaigns are under consideration for French West Africa, French Equatorial Africa, Mozambique, Tanganyika, and Uganda. The health administrations of the Belgian Congo, the French Cameroons and other countries are continuing the anti-yaws activities already undertaken.

Investigations continued in 1956 into some of the severe nutritional problems which afflict the Region—for instance kwashiorkor

relative efficacy of three different forms of treatment for trachoma

Among the other activities in 1956 were examination of statistical procedures for assessing the quality of drinking water help in preparing suitable schedules and recording procedures for family health surveys in India and Sweden and assistance in the statistical planning of tuberculosis surveys in Africa

### International quarantine

The year 1956 marked the entry into force of two sets of Additional Regulations to the International Sanitary Regulations. These dealt with the amendment of provisions relating to yellow fever and the modification of the form of the international certificate of vaccination against smallpox. Adoption by the Ninth World Health Assembly of further Additional Regulations had the effect of withdrawing as from 1 January 1957 the special measures applying to the Mecca pilgrimage. In connexion with this change the Annual Report notes that Saudi Arabia has with the help of technical advice from WHO established a large modern quarantine station at Jeddah. In 1956 WHO at the request of the Saudi Arabian Government

arranged for a group of quarantine experts to visit Saudi Arabia and report on health installations catering for pilgrims. The group reported favourably to the Committee on International Quarantine with the result that the abrogation of the special provisions relating to the Mecca pilgrimage in the International Sanitary Regulations was recommended.

A survey of sanitary charges levied in ports was continued in 1956. It showed that in fact few countries continued to levy charges which are not authorized by the Regulations and that the health authorities concerned when their attention was drawn to the matter readily consented to bring their practices into line with the Regulations. All the countries which still required bills of health have now agreed to cease the practice in order to conform with the International Sanitary Regulations.

At the request of the Committee on International Quarantine the Organization carried out an enquiry to determine whether the direct transit areas at 37 airports located in 24 countries conformed to the requirements demanded by the International Sanitary Regulations in particular as regards the segregation and medical supervision of passengers and air crews.

## DRUGS AND OTHER THERAPEUTIC SUBSTANCES

In 1956 the standardization of pertussis vaccine was successfully completed. This ranked as a considerable achievement for the laboratory studies which had been carried out in parallel with field trials had shown that the protective value of a pertussis vaccine in children was indicated by the laboratory assay in mice. This was unique in the history of vaccine control and pertussis vaccine is the first bacterial vaccine to be internationally standardized.

The availability of the new stable freeze dried smallpox vaccine has been mentioned elsewhere in this review. No international

standard has yet been proposed for a poliomyelitis vaccine although several laboratories are now trying to develop stable freeze dried products.

The Expert Committee on Biological Standardization approved the establishment of international standards for various antibiotics and gave further consideration to a programme for the standardization of antivenoms.

During the course of the year the Expert Committee on Addiction Producing Drugs made recommendations for bringing under international control two analgesic drugs of

morphine like character. The Committee also gave more precise definitions of habit forming drugs. It felt that the barbiturates as habit forming and in some circumstances addiction producing drugs and the tranquilizing or ataraxic agents as potentially habit forming drugs should be subjected to national control measures. The medical principles and methods for the treatment and rehabilitation of drug addicts were also outlined by a study group.

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Investigations continued in 1956 into some of the severe nutritional problems which afflict the Region—for instance kwashiorkor

anaemias pellagra and endemic goitre Results obtained by a WHO nutrition team which had been working on the kwashiorkor problem in Uganda revealed that 10% 25% of the children between the ages of 1 and 3 years pass through a phase in which clear signs of malnutrition can be found

In Basutoland the Government has recently started a pilot project against pellagra the most important nutritional problem there A WHO team is making a detailed survey of deficiency diseases in the territory and has made several clinical nutrition surveys and spent one year on a family dietary survey

The most common cause of morbidity and mortality in some parts of Africa is the anaemias The island of Mauritius is a typical example and WHO has assisted there in research into the question Malaria which was formerly endemic in the island was thought to be the cause of many of the anaemias but although malaria has now been eliminated the problem of anaemias has shown no improvement At the Government's request therefore WHO has sent a haematologist to assist in clarifying the etiology of these conditions

One of the more important activities of the Regional Office during the year was the organization of a Seminar on Vital and Health Statistics which was jointly planned and convened by the WHO Regional Office and the Commission for Technical Cooperation in Africa South of the Sahara This stemmed from recommendations by both the Expert Committee on Health Statistics in 1954 and the Conference for the Seventh Decennial Revision of the International Lists of Diseases and Causes of Death in 1955 that WHO should devote a substantial part of its statistical activities to a search for methods suitable for under developed countries The seminar was therefore planned to give representatives of statistical and health administrations in the Region an opportunity to discuss their common needs and such experience as they had of ways to meet those needs in vital registration population recording and medical reporting

## REGION OF THE AMERICAS

Three principal long range objectives governed the work in this Region during 1956—the strengthening of health services the promotion of education and training and communicable disease eradication

Considerable progress was made during the year towards malaria eradication The Annual Report gives prominence to a description of the organization and administration of Mexico's programme of malaria eradication which is being carried through in close collaboration with WHO and UNICEF The Organization has assigned a malanologist an insect control adviser and two sanitarians to the project It has also awarded a number of fellowships to Mexicans for malaria study and training in Venezuela Brazil and the USA Other WHO assistance included training for antimalaria workers and continuing close collaboration with the Mexican national malaria service in plotting every step of the campaign

Guatemala received help from the Organization in the establishment of a training programme for nursing auxiliaries Initially the work consisted of a training course for instructors and this was followed in May 1956 by a course for auxiliary nursing personnel which was attended by 106 students and given by ten instructors trained in the earlier course Later the trainees began their clinical practice in the Guatemala City General Hospital It is hoped that training will be continued until there are instructors in at least one centre in every province and in the principal hospitals of Guatemala City

The supply of adequate numbers of reliable and disease free animals to laboratories is essential if research is not to be hindered and this question has been of direct concern to the Organization during 1956 A project was designed specifically to assist national public health laboratories in the establishment of disease free animal colonies Requests for assistance were received from eighteen countries for more than twenty laboratories WHO provided consultants to

give expert advice on the best methods of keeping and using laboratory animals and to undertake surveys of the present situation and future needs. Demonstrations, seminars and fellowships were also arranged to aid in the training of national personnel.

Among other work carried out in the Region during 1956 mention may be made of the continued assistance in the rural public health services project in Ecuador which included the training of 92 public health workers in five courses and the beginning of a programme of supervision of auxiliary personnel. The Organization also gave advice on a variety of statistical questions to many countries.

### SOUTH EAST ASIA REGION

The main emphasis in 1956 was placed on basic needs such as sanitation, health education and training—particularly for auxiliary health workers. Activities continued to expand and 116 WHO assisted projects were in operation in the Region as compared with 99 in 1955. Sixty-two fellowships were awarded between 1 January and 30 November 1956.

The training of all categories of health and medical personnel played a significant part in the year's work. Many refresher and post-graduate courses were organized. WHO field staff assisted in 30 refresher courses which provided advanced training for approximately 400 participants.

WHO increased its assistance to statistical services in countries of the region and in some instances aided in the organization of statistical systems. This work is considered to be of particular urgency as the Report reveals that for three out of the seven countries in the South East Asia Region no reliable birth and death rates are available.

The Regional Office devoted considerable attention in 1956 to the promotion of rural health centres on which it is foreseen all medical services will be based. As the Report points out, the rapid development of rural health services is the first step in the integration of disease control programmes into the general public health services.

Referring to some of the other major activities the Report states "Malaria-control programmes in the seven countries of the Region are gradually being directed towards eradication which in four of these countries there is a prospect of achieving within a reasonable time. Campaigns against leprosy continue to make slow progress in four countries; action against it is now being undertaken on a national scale. Plague seems to have become less acute in the last few years which is possibly due in part to the effective insecticides used in malaria campaigns. Research on plague is being carried out in two of the countries of the Region with the assistance of WHO and may lead to new methods of control. According to present plans spraying in connexion with the malaria-control campaigns will in time cease and therefore research on plague becomes doubly important."

The Indian Plague Research Project which is assisted by WHO has been in operation since 1952. The year 1956 saw intensive field research continued and the establishment of a field laboratory in the project area. "Thirty-two strains of *Pasteurella pestis* were isolated from different species of domestic and wild rodents in the course of more than 13 000 autopsies of rodents. Laboratory studies have been carried out to identify the different strains and to compare them with already known types; this research is still in progress. The susceptibility to the infections of strains of *P. pestis* of each of the species of wild rodents present in the project area was investigated in the laboratory of the Institut Pasteur in Teheran [which has been actively associated with this project since 1954] and it was established that rodents of the species *Tatera indica* showed the greatest resistance to plague infection."

Work is still continuing and no final conclusions have yet been drawn from the epidemiological research so far undertaken. However, the experience which has already been gained in this project will be put to good use in Indonesia, as the Government there has requested help from WHO in examining the plague situation in the country.



and modifying the control methods now in use

In Ceylon a programme to improve rural sanitation was initiated in 1955 with assistance from WHO and UNICEF and financed by the United Nations Expanded Programme of Technical Assistance. A pilot project at Kurunegala was in operation during 1956 and when sufficient experience has been gained it is proposed to extend similar sanitation measures to all parts of Ceylon. Work has been concentrated on improving local water supplies and bettering methods for the disposal of organic wastes. A number of protected wells with hand pump equipment were constructed and about a thousand latrines were made.

Among other noteworthy projects in operation in the Region were the following:

1. A three week regional seminar for nursing leaders which was held in Delhi in August. Thirty one nursing leaders from Burma, Ceylon, India, Indonesia and Thailand participated.

2. The work in Bombay State designed to improve and expand the existing maternal and child health services was continued. Emphasis was placed on the needs of rural areas. The project is assisted jointly by WHO and UNICEF and was started in August 1955. Under the Technical Assistance Programme WHO has provided a maternal and child health officer and two public health nurses. A training centre was established at Sirur near Poona where medical officers in charge of village dispensaries received courses in public health with special reference to rural services. In 1956 a total of 485 medical officers, nurse midwives, midwives and sanitary inspectors completed courses at the training centre.

#### EUROPEAN REGION

The untimely death of the Regional Director Dr Norman Begg in 1956 was a serious loss not only to the Regional Office but also to many friends of WHO throughout the Region. Dr P. J. J. van de Calseyde was nominated as his successor.

The principal features of WHO's work in the European Region during 1956 continued to be the study of health problems common to countries of the Region, the spread of information, the exchange of ideas and the training of health personnel. Much of the work took the form of inter country programmes. Technical meetings organized by the Regional Office covered such subjects as professional education and the organization of public health services. The series of European seminars for sanitary engineers afford an example of co-operation between governments of the Region and WHO. In 1956 the Fifth European Seminar for Sanitary Engineers was held in Helsinki in co-operation with the Government of Finland. Principal topics of discussion were ground water pollution (especially of chemical and organic origin) in Europe and measures for its prevention, the pollution problem in relation to water economy as a whole, the dangers associated with the disposal of certain toxic industrial wastes, special problems in northern Europe in disposing of pulp mill wastes and the increasingly important problem of the safe disposal of radioactive wastes.

As part of the Regional Office's long term plan for the furthering of nursing education a conference on post basic nursing education was convened in 1956 as a sequel to the study group on basic nursing curriculum held in 1955. WHO organized the conference in co-operation with the United Kingdom Government and with the assistance of the Department of Health for Scotland. Special consultants in nursing education, general education, psychology, sociology and public health administration assisted in the work of the conference.

In the course of the year the Regional Office devoted considerable attention to the question of accident prevention both inside and outside the home. With more effective control of the infectious diseases, accidents have assumed greater prominence as the cause of sickness and death and as the Report says "accidents have also increased absolutely for technical advances



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*Bilharzias control on the island of  
Leyte in the Philippines. A member  
of the team taking a blood sample for  
a haemoglobin test*



*School health programme in Thailand. Trainee teachers  
receive practical instruction in examining children*



industrialization and increasing mechanization in Europe create new hazards. At the same time knowledge about accidents is accumulating, organized attempts to reduce accidents are gaining momentum and the conception that accidents are the result of fate, bad luck, or chance is gradually losing currency." The meeting of the Advisory Group on the Prevention of Accidents in Childhood which was convened by WHO considered in particular methods for collecting and analysing data concerning accidents. It concentrated its discussion on the basis of preventive measures and made a number of detailed recommendations. These included the need for public health authorities to give accident prevention work a high priority in their programmes and the necessity of obtaining more particularized information concerning accidents themselves and morality which may lead to them.

Another aspect of WHO's work in Europe during the past year was the continuation of assistance to various European countries in the rehabilitation of handicapped children. In Yugoslavia where there are estimated to be some 12,000, a WHO consultant has made a detailed survey of the facilities and needs in the six Yugoslav Republics. In Greece a WHO consultant and a UNICEF representative discussed a national rehabilitation plan with the Greek Government. As a result a national council for rehabilitation was set up by the Government. Discussions of a somewhat similar nature in which WHO participated took place in Spain where a national rehabilitation plan is at present being considered. WHO and UNICEF have also continued to assist rehabilitation work in Austria and Italy.

#### EASTERN MEDITERRANEAN REGION

Although WHO's work in this Region during the year was concentrated primarily on strengthening national health services, expanding and improving educational opportunities for their staffs and developing control methods for the major communicable diseases, the Report underlines the fact that

many different types of programme are necessary in the Region in order to meet the individual requirements of countries which are in very different stages of development.

The Report provides examples of the differing types of programme necessary for work in the field on malaria eradication and against tuberculosis. In those countries where malaria eradication programmes are impracticable, WHO has restricted its work to surveys, research and small pilot projects. In the case of tuberculosis it has been found that with certain countries it is not economically justifiable to embark on mass BCG operations. WHO's survey teams have found that although tuberculosis is present in all countries in the Region its incidence is uneven.

One development in the Regional Office during the year was the appointment of four public health advisers to co-ordinate WHO programmes in small groups of countries in the Region. Preliminary results of this trial system showed it to have strengthened the link between the Regional Office and the national health administrations.

An important Regional project which made considerable progress in 1956 was the training centre for auxiliary health workers which is located at Gondar, the capital of Bege-medir Province in eastern Ethiopia. This centre, which is a joint project of UNICEF, the United States International Co-operation Administration and WHO, was established as a sequel to a formal request made by the Ethiopian Government. The school opened in 1954 with some 30 student health officers on a three-year course. In 1955 a second course was started for health officers and a first two-year course for community nurses, and in 1956 there was a one-year course for sanitarians. In conjunction with the training centre, which is attached to the existing hospital at Gondar, the nucleus of a provincial health service has also been started. One health centre has already been established and others are planned.

Antimalaria work in Iraq in 1956 was organized on a malaria eradication basis. The WHO demonstration team, with full governmental co-operation, carried out residual

spraying in the four northern districts of Iraq and gave protection to approximately 1¼ million inhabitants. A further 150 000 people living in urban areas were also indirectly protected by spraying a belt around the cities as well as by larviciding. Since the inception of WHO/UNICEF assisted malaria control in 1952 WHO staff members have taken full charge of the expanding anti-malaria activities in the northern districts and demonstrated means whereby the control programme could be transformed into an eradication programme. A five year malaria eradication programme has now been sanctioned by the Iraq Government whose total expenditure over this period will amount to more than \$8 000 000.

In view of the rapid evolution of health services in various countries of the Region WHO organized a travelling seminar on public health administration. This gave health officers an opportunity of discussing their own problems and of seeing what was being done elsewhere. The group which was led by two experienced consultants who acted as seminar leaders comprised 15 participants from 14 countries and territories of the Region. They visited various types of health service projects in Egypt and Sudan. Particular attention was paid in Egypt to the WHO assisted Calouh Demonstration Area the objects of which are to find out the best way of providing rural health services within the financial means and in harmony with the social structure of the country and in Sudan to the ten year health development plan and the system of training and utilization of auxiliary personnel.

#### WESTERN PACIFIC REGION

In general terms the Western Pacific Regional programme in 1956 was directed towards strengthening national health services integrating field projects in a planned public health service and methods of alleviating the shortage of trained personnel both professional and auxiliary.

One of the major problems in the Region is that of environmental sanitation. An

aspect of this question to which the Regional Office has devoted considerable attention is the collection and disposal of organic wastes. WHO collaborated closely with the governments of the Region and in particular the Government of Japan to develop a practical solution to this problem. Following advice from WHO a pilot plant was constructed in Kobe Japan for aerobic composting of urban refuse and night soil. After a year's successful operation the Japanese Government decided to proceed with the construction of a full scale prototype composting plant. This which was operating in 1956 showed that the aerobic method was practical and economical. The Japanese Ministry of Health and Welfare is now proposing to subsidize the erection of similar composting plants in ten other Japanese cities.

The techniques developed during the work in Kobe were presented at a seminar organized by WHO in Taiwan on the collection disposal and utilization of organic wastes. The seminar was attended by about 40 public health technicians from seven countries of the Region.

The Central Medical School in Fiji which has a history dating back to 1878 has received assistance and advice from WHO in the course of the past few years. Advice was requested by the Fiji Government and as a result of recommendations made WHO provided two lecturers for four years and two fellowships. The Government has co-operated closely and the standard of teaching in the school has been improved and it is becoming of increasing importance in supplying trained health personnel for the smaller Pacific territories.

Other work in the Region during the past year included a nursing education project in Japan the continuation of yaws control measures in the Pacific islands the consolidation of BCG programmes as a preliminary to their incorporation in national public health services and the establishment of two Regional poliomyelitis centres—one in Singapore and the other in Tokyo. Several countries have already made use of these centres and work is expected to increase.

# Promotion of Research by WHO

*Extracts from the introduction to the Annual Report  
of the Director General for 1956*

"[Research] constitutes the real backbone of the various activities through which the Organization is striving to promote world health. The experience gained through the field projects initiated by WHO has demonstrated the need for the Organization to stimulate and co-ordinate research work. Indeed when public health measures are applied under unusual circumstances it is often found that not enough is known about the problem and its environmental aspects to ensure success. In fact many of the preliminary pilot studies which are conducted by the Organization before deciding on a plan of action can be considered as carefully designed research projects the results of which are of value not only to the country immediately concerned but also to other countries where similar conditions exist.

The task of defining a given public health problem in its simplest terms and the setting up of a research programme which might be needed for its solution is sometimes carried out by the Organization's technical staff in consultation with members of the various expert advisory panels. Often however the initiative in this field begins in an expert committee and subsequently the co-operation is also secured of the leading authorities on the particular subject of research. In other cases both devices are used at various stages of the preparation of the programme.

• •

The latter method was employed in connexion with the problem of development by disease vectors of resistance to insecticides. I have already mentioned the importance of this

problem for the future of antimalaria work but it is obvious that this issue has a general bearing on the future of a number of activities undertaken against various other communicable diseases. It is imperative that we learn more about the fundamental facts concerning resistance and about the ways in which it can be avoided or prevented. The first logical step taken by the Organization was to carry out a survey on the present state of research on these questions. WHO consultants visited in 1955 over one hundred laboratories concerned with resistance problems. The study submitted in 1956 to an expert committee on insecticides revealed the gaps in our knowledge and the committee was able to draw up a plan for additional research programmes. With WHO's co-ordination members of the expert advisory panels and several scientific institutes have developed basic methods of measurement of susceptibility or resistance of vector populations. For instance a method for testing the susceptibility of lice has been developed. The results of the tests made in many parts of the world were collated and will be published by WHO early in 1957. As a result of this work the Organization is now in a position to give information to governments on the best methods to be used to control typhus fever in those areas where resistance has occurred as well as in those in which the insect is still susceptible. The Organization is also able to stimulate research on other insecticides to those normally used in typhus control programmes which might be employed when complete resistance is met. An extensive system of exchange of information has been established on problems of resistance in general. This system now involves more than

300 workers in the field and makes it possible for many laboratories to plan specialized research concentrating on those questions for which they are particularly suited. There is no doubt that the cross-fertilization of ideas which resulted from the stimulation and coordination provided by WHO in this field will generally increase the knowledge of this vitally important problem of resistance to insecticides.

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WHO's antirabies activities highlight the primary role expert committees play in the promotion of essential research work. In 1950 an expert committee defined the many avenues which lay open for the investigation and study of problems involved in rabies prophylaxis and control in man and animals. Since none of these problems can be attacked successfully by any single institute in any country, a series of coordinated projects was initiated, aided by small financial grants from WHO in laboratories situated in five different countries. There were for instance field trials in Iran on the use of serum in persons seriously exposed to rabies in Spain on the local treatment of the wounds in Malaya and Israel on new vaccines in the control of the disease in animals and in France and the United States of America on the standardization of potency tests of vaccines and sera. The results of these trials and of further studies carried out over the last six years were evaluated by an expert committee which met in 1956. All this cumulative research work has clarified several aspects of rabies control relating among other things to the modification of dosage schedules of vaccines and sera in prophylactic treatment after exposure to the minimising of side reactions to serum and vaccines and to the prior basic immunization of persons likely to be exposed to risk of bites by rabid animals. Another important step taken recently was the setting up in co-operation with an expert committee

an biological standardization of an international standard serum and of a reference vaccine.

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The latter achievement is part of WHO's fundamental task of providing the various branches of medical science with units of measurement which have always been a basic need for their progress. Most of the time these units can only be established by reference to standard preparations. Almost invariably, the creation of such standards, whether they are for pharmaceutical preparations for sera or for vaccines is preceded by intensive research carried out in laboratories all over the world under the guidance of expert committees and mainly of those responsible for biological standardization and for the preparation of the International Pharmacopoeia.

In the case of vaccines, strictly controlled field trials are often indispensable to determine the relationship between the results of laboratory tests made on animals and those expected when the vaccine is applied to man. This relationship has been successfully established for smallpox vaccine as the result of a long series of studies initiated by WHO in 1952 and completed in 1956. These studies have also shown that it is possible to prepare a dry smallpox vaccine stable at 45° C for a duration of at least two years. The method of production of the new vaccine has been made available by WHO and its adoption should greatly improve the prospects for the control of smallpox in hot countries. Furthermore an expert committee on biological standardization which met in 1956 considered the vaccine sufficiently stable to warrant the establishment of an international reference standard on which preliminary work has already begun. Similar investigations are being conducted by WHO on other vaccines in order to ensure that they can play their proper role in public health programmes.

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Research we have seen is essential to WHO's effort to control and prevent the communicable diseases which still plague the major part of the world. It is also a basic factor in most of the programmes WHO has undertaken to promote world health by all those positive means which are today at the disposal of medical science.

The study of the psychobiological development of the child is I believe a good example of what co-ordinated research can achieve in the understanding of complex problems in the field of mental health. There exists obviously a great deal of scattered knowledge on child development but such information remains largely within the separate compartments of scientific disciplines. It was precisely to break down the barriers between the various specialists and to stimulate inter disciplinary research on the various aspects of the problems that the study group for the psychobiological development of the child was convened by WHO four times during the period from 1953 to 1956. These meetings were attended by experts in anthropology, psychology, psychoanalysis, electro-physiology, human biology and ethology, and yielded some useful information on the biological, psychological and cultural factors influencing the development of children and of adolescents.

The study of protein deficiency in young children provides an excellent example of inter-agency co-ordination in research work devoted to major nutritional problems. Protein deficiency disease in infants and children has been the cause of high morbidity and mortality in many countries. In the majority of cases there is no total lack of protein but rather inadequacy of protein in a form suitable for the young child, especially when milk cannot be made available. The obvious solution is of course to find methods through which the vegetable and fish sources of protein available in a given country could be used to the fullest

possible extent. However before this can be done more must be known about certain dangers which exist in using such foodstuffs and about the means whereby their optimum value can be obtained. These problems which concern all parts of the world were discussed at the meeting convened in the United States of America in 1955 by FAO and WHO with financial aid from the Josiah Macy Jr Foundation. Experts in protein nutrition met experienced workers from the United States and Europe such as biochemists engaged in the experimental feeding of animals, scientists studying the most efficient methods of feeding stock as well as paediatricians and general medical nutritionists.

The final decision regarding the safety and suitability of any food is a very highly specialised matter. Therefore a small advisory group drawn from members of the WHO Expert Advisory Panel on Nutrition was formed. This group met twice in 1956 and both meetings were attended by FAO and WHO staff members and by representatives of UNICEF which has a great interest in the prevention of malnutrition. A satisfactory agreement was reached on the programmes of work to be followed by the three organisations. In addition to giving technical guidance the members of the advisory group assist individually by conducting tests in their own laboratories of different foodstuffs and by suggesting other institutes competent to do this.

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While the study of protein deficiency is still in its early stages research undertaken on endemic goitre, another public health problem in the field of nutrition has already advanced to the point where the major difficulties appear to be solved. Prevention of goitre in the countries where it is still endemic depends mainly on the iodination of crude salt in use. It was first necessary to evolve a method for iodinating and in 1950 at the request of WHO the Chilean Iodine Educational Bureau of



300 workers in the field and makes it possible for many laboratories to plan specialized research concentrating on those questions for which they are particularly suited. There is no doubt that the cross fertilization of ideas which resulted from the stimulation and co-ordination provided by WHO in this field will generally increase the knowledge of this vitally important problem of resistance to insecticides.

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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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London undertook that work. The technique it developed established the possibility of iodizing crude salt on a very extensive scale.

After having carried out a series of investigations the Bureau has also concluded that iodates have certain advantages over iodides mainly because of their stability under adverse conditions of moisture sunlight heat and impurities in the salt. Before a recommendation could be made on the use of iodates however two points had to be examined one relating to their toxicity and the other to their efficacy.

Studies in the United Kingdom and the United States of America have proved that when given by mouth sodium iodate has a very low toxicity. As to the problem of efficacy tests made in the United Kingdom revealed that taken by mouth practically all the iodine of the iodate is available to the thyroid gland. Furthermore controlled field experiments in Latin America definitely indicated the effectiveness of iodates in the prevention of goitre.

On the basis of the results of the studies mentioned WHO decided to assist countries in developing the new technique of iodizing. In 1954 consultants with extensive experience in the public health aspects of endemic goitre visited sixteen countries in Latin America. The recommendations of these consultants were accepted by each country and by 1956 most of them were taking action to provide iodized salt for their populations.

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The examples I have given show the essential place certain institutions have in the research activities promoted by WHO in acting as international centres of co-operation in the investigation of specific problems. Often this task involves undertaking difficult laboratory or epidemiological tests for countries at present unable to carry them out themselves

and ensuring comparability of such tests. In other cases their function may be to classify and compare pathogens isolated all over the world so that the epidemiology of communicable diseases can be studied on a world wide scale. Such international laboratories or centres exist for example for influenza poliomyelitis treponematoses leptospirosis brucellosis shigella infections biological standardization and blood grouping. The results achieved by these institutes testify to the increasing importance of the promotion of research to ensure the success of the programmes WHO is engaged in for the benefit of world health.

The research activities stimulated promoted or co-ordinated by WHO illustrate the catalytic effect the Organization can have on the work carried out by national health administrations. They also show how much can be accomplished by WHO even when the staff and funds available to it are rather limited. Indeed experience has proved that when a sound research programme is formulated individuals and institutions are willing to co-operate in it with all the means at their disposal. As a general rule WHO's financial help is needed only for supplies or special equipment not obtainable within a country or for the cost of additional technical assistance when the physical burden of the work is unusually heavy. In any case this financial contribution is seldom more than a small fraction of the total cost of the programme and immeasurably less than the value of the results to Member States.

In conclusion it seems to be clearly established that promotion of research is one of the keystones for WHO's future work and that the success of many of our activities will depend on our ability to make a judicious use of the devices we have evolved to increase and to perfect our knowledge of the problems we have to solve in order to raise health standards throughout the world.

## SEARCH FOR A LIVE ANTIPOLIOMYELITIS VIRUS VACCINE

Vaccination against poliomyelitis is one of the subjects with which WHO has been actively concerned for several years. At the end of 1955 a number of experts convened by WHO discussed the various aspects of this problem and formulated technical opinions<sup>1</sup> to which the health authorities of many countries have frequently referred. At present WHO is encouraging research in this field in various ways. Studies carried out in Northern Ireland (with the financial support of the National Fund for Poliomyelitis Research, the Medical Research Council and WHO) on the application of attenuated live virus vaccine have recently been described.<sup>2</sup> Others have been published in the United States of America.<sup>3,4</sup> Dr A. M. M. Payne summarizes the conclusions reached in these studies in a note which will appear shortly in the *Bulletin of the World Health Organization*<sup>5</sup> from which the following is taken.

The application on a relatively large scale of an antipoliomyelitis vaccine based on virus inactivated with formalin—the Salk vaccine—marks an advance in public health measures. By means of this vaccine we are able to exercise some control over a dreaded disease which is increasing in frequency over a large part of the world.

However it cannot yet be claimed that poliomyelitis has been conquered. The vaccine prevents paralysis in a large proportion of cases but not in all; the duration of immunity is still unknown and reinforcing injections may be needed at intervals throughout life. Moreover some authorities consider that it is desirable for immunity to be

maintained by constant contact with an apparent infection prevalent in the environment. However in economically advanced communities this asymptomatic natural infection can hardly be relied upon for reinforcing vaccinal immunity since the infection itself is becoming less widespread although clinical disease more often results. Furthermore the preparation of inactivated virus vaccine involves technical difficulties: it is costly and the vaccine must be administered by injection.

Theoretically an attenuated live virus vaccine administered orally would overcome some of these drawbacks. It should confer the same immunity as that given by natural infection without the accompanying risk of paralysis. Many workers are now endeavouring to perfect a vaccine of this type. They have shown that a virus vaccine of diminished virulence for the monkey when administered to man orally can promote the formation of antibody without the accompaniment of any appreciable disease symptoms in the person vaccinated. We must now establish which strain could be used in practice and many problems arise here. As is known attenuation is not an all or none property of the polioviruses; on the contrary different strains exhibit a whole range of virulence. Their activity may vary from high neurotropism manifested by paralytic symptoms in chimpanzees fed with the virus to maximum attenuation shown by the absence of paralytic symptoms in chimpanzees inoculated intraspinally with the virus—this procedure representing the most severe form of exposure.

It has been found that man is more susceptible than the chimpanzee and monkeys to alimentary infection with poliovirus administered orally while it is believed that he is the least susceptible of these primates to infection of the central nervous system. Moreover an experimental vaccine which

Wld Hlth Org. An R. Ser 1956 101  
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K. P. H. (1956) *J. Amer. med. A.* 160 954  
P. A. M. (1957) *Bull. Wld Hlth Org.* (in press)

## SCHEDULE OF MEETINGS

7-25 May	Tenth World Health Assembly Geneva
27-31 May	Twentieth session of the Executive Board Geneva
12-15 June	Sub-Committee on Non-Proprietary Names of the Expert Committee of the International Pharmacopoeia Geneva
17-24 June	FAO/WHO Expert Committee on Food Additives Geneva
24-28 June	Study Group on Histological Definitions of Cancer Types Oslo
27 June-5 July	Conference on Health Education of the Public Wiesbaden
15-20 July	Expert Committee on Poliomyelitis Geneva
25-31 July	Technical Conference on Insect Resistance Geneva
2-6 September	Expert Committee on the Public Health Aspects of Water Fluoridation Geneva

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Appendix

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

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fails to paralyse the lower primates by intracerebral inoculation and which produces paralysis in them only when injected intraspinally in large doses will not paralyse the chimpanzee whatever the route of inoculation. It is very likely that the same holds true for man and that the attenuated virus taken orally will not affect the nervous system although giving rise to an immunizing asymptomatic infection in the digestive tract. Poliovirus strains capable of conferring immunity in this way exist. It might therefore be thought that a live virus vaccine is already available before such a vaccine could be used; however many difficulties remain to be solved.

#### *Live virus vaccine problems*

The poliovirus like most viruses produces a certain number of variants; the very fact that attenuated viruses exist proves this. Thus when investigating the value of an attenuated virus for immunization one must be sure that it will not revert to the virulent state and that if some particles are more virulent than others they will not outgrow the attenuated particles in the digestive tract.

The studies in Northern Ireland already referred to were carried out with two strains of attenuated virus. The first a type 2 virus was administered to adults, children and infants in most but not all it brought about the formation of antibody; the immunized persons excreted the virus in the faeces during a month or more. The excreted viruses unlike the vaccine from

which they came were cytopathogenic in tissue culture and virulent for monkeys when inoculated intracerebrally. This strain was consequently considered to be unsuitable for vaccination in its present form. The second attenuated strain used was a type 1 virus. The formation of antibody was observed in all persons; fed no significant morbid symptoms appeared and the virus was excreted in the faeces. In some instances the excreted virus appeared rather more virulent than the vaccine virus. This strain has the advantage over the preceding one of being cytopathogenic so that it can be obtained as a pure strain from a single particle by Dulbecco & Vogt's method. The virus used in these studies had not been purified in this way. Further studies of this strain using purified material are proceeding.

The problem of contagion must also be considered. It is known that under unsatisfactory hygiene conditions the virus excreted in the faeces of persons vaccinated with live virus can pass to non-vaccinated people; furthermore an increase in virulence of the virus after repeated passage cannot be excluded since the degree of stability which can be expected in an attenuated virus has not yet been established.

Altogether many problems remain to be solved before the use of an attenuated live virus vaccine which is safe for the individual can be extended to the whole community. Studies are continuing with the aim of administering the attenuated experimental virus vaccine to larger and larger groups in order to develop methods of confirming its harmlessness and assessing its effectiveness.

#### *Report on poliomyelitis vaccination*

The report of a WHO-convened group of internationally known scientists who met in November 1955 to consider the state of poliomyelitis vaccination (see *Chronicle of the World Health Organization* 1956 10 3) has been published as No. 101 of the *Technical Report Series*. This report although it is termed a "preliminary review" of its subject provides an authoritative opinion on one of the most promising of recent developments in disease prevention.

## MALARIA CONTROL MEASURES IN AFRICA

If malaria is to be eliminated as a serious public health problem in Africa one prerequisite is the supply of additional information on the hyperendemic and the holoendemic areas. However, before elimination can be considered, control must be effective and to achieve full success for the present malaria control programmes inter-country co-operation will soon become necessary. These views met with the general agreement of the 25 malariologists, entomologists and public health officers from all parts of South and East Africa who were present at the WHO-sponsored technical meeting on malaria which was held in Nairobi, Kenya, in November 1956. This meeting, which had been convened by WHO's Regional Office for Africa, was the first of its kind to be held in East Africa and to deal with the practical details of malaria control.

The Report of the meeting contains a good illustration in the remarks made by the Director of the Medical Services of Kenya of the changing pattern of malaria control in Africa. He said: "Malaria has throughout the comparatively short history of Southern Africa been one of the major scourges of these territories and has often seriously retarded development in the region. Much progress has been made over the last quarter of a century both in the application of control measures and in improved methods of treatment. The progress which has been made in reducing the ravages of malaria is shown most dramatically in the reduction of that important sequel to malaria infection, blackwater fever, which formerly took such a grave toll particularly of the migrant races to Africa. Blackwater has now become rare so much so that many medical practitioners in this country have never seen a case."

### Country wide control difficulties

Although considerable progress has been made nevertheless there are many difficulties

which still lie in the way before country wide malaria control can be achieved in tropical East Africa. The Nairobi meeting provided a valuable forum for discussion of questions such as the resistance of vector anophelines to chlorinated hydrocarbon insecticides and the sorption of insecticides by mud walls and also for the consideration of many technical and administrative factors relating to the present status of malaria control campaigns in the territories represented.

In view of the importance of *Anopheles gambiae* as a malaria vector in Africa and the difficulties encountered in achieving complete interruption of transmission in equatorial areas the World Health Organization has set up an advisory and research team which will be put at the disposal of governments for the study of the genetics and the biology of the species.

### Status of malaria control in South and East Africa

During the discussion on the status of malaria control programmes a number of new and significant facts were presented by the representatives from the various States and territories.

#### *Sisal Island*

One hundred and thirty thousand people out of a total population of 231 000 live in potentially malarious areas. After ten years of anti-malaria work the general parasite rate had by 1956 dropped to 0.7% while the infant parasite rate has been at zero for the past two years. It has proved possible to discontinue control operations in some areas but surveillance is continuing.

#### *Zanzibar*

The entire population of 265 000 live in malarious areas. Good anti-larval work has



been carried out in the main towns for the last twenty years and the town of Zanzibar itself is now considered malaria free. A new territory wide control programme assisted by WHO and UNICEF will shortly commence operations.

### *Mauritius*

The island wide residual spraying campaign has mastered malaria and has eradicated one of the vectors *A. funestus*. Some *A. gambiae* breeds along the coast but it is apparently a poor vector. In 1955 there were only 34 malaria cases many of which may have been relapses.

### *Kenya*

Four million two hundred thousand out of a total population of 5 1/2 million live in malarious areas. The situation is complicated by the existence of hyper and holoendemic malaria in the lowlands and seasonal epidemic malaria in the highlands. Control measures have so far been confined mostly to urban and highland areas. Residual spraying in coastal towns has given good results in the control of *A. gambiae* and in the Nandi district epidemic malaria has not occurred since the application first of chemotherapeutic measures consisting of a single dose of pyremethamine to the whole population and later of residual spraying of dieldrin.

### *Tanganyika*

Two thirds of the total population of 9 1/2 million live in malarious areas. Control measures have been confined to urban areas and larger settlements. They have consisted mostly of antilarval work. The East Africa High Commission's pilot project in the Pare Taveta area is of special interest. Its objectives are to test the possibility of stopping malaria transmission by residual insecticide (dieldrin) spraying and to assess the effects of freedom from malaria. Results have been encouraging and there have been significant reductions in malariometric rates.

### *Somaland Protectorate*

Of the total population of 640 000 it is estimated that 90% is nomadic. The majority of the inhabitants spend six months of the year outside the country in areas subject to seasonal epidemics of malaria. In Somaliland itself there are few areas where permanent water is found but where it is *A. gambiae* breeds all the year round and maintains a low constant endemicity. BHC residual spraying has reduced spleen rates from 25% to zero in these foci. A control programme assisted by WHO and UNICEF to cover the area of seasonal epidemicity in the Haud is planned.

### *Ethiopia*

Five to seven million people out of a total population of 15 million live in malarious areas. Pilot projects assisted by the United States International Co-operation Administration and by WHO were started recently and it is hoped that control will be extended to wide areas in the future.

### *Ruanda Urundi*

Three quarters of the population of 4 1/2 million live in malarious areas. Control work has been under way since 1949 and now covers all areas up to an altitude of 2000 metres. The infant parasite rate in the plains has been reduced from 48% to 13%.

### *Mozambique*

Malaria exists in meso or hyperendemic form throughout the territory. Control work is carried out in all large centres and in irrigated areas. Lourenço Marques can be considered as malaria free. Antilarval work is done in towns but residual insecticide spraying is used in the surrounding areas.

### *Southern Rhodesia*

Malaria remains well under control. Anti-malarial operations were started in 1949. DDT was used in the first year and after that BHC. In the 1955/56 season the central

plateau area with a population of 1<sup>1</sup> million was left untreated and an area with a population of one million around the periphery was treated. In the present season chemotherapeutics were also used in this peripheral area.

### Union of South Africa

Antimalaria work was originally started in 1922 and has resulted in the interruption of transmission over large areas. Steps to effect complete eradication of malaria are now contemplated. Measures now used include residual spraying with DDT and BHC and antilarval work with DDT emulsion. A system of tracing every malaria case is in force.

### Madagascar

The population of five million is protected by residual insecticide spraying combined with chemotherapeutics administered to all children up to the age of 15. Results on the high plateau and on the west coast have been excellent though on the east coast where there is a long transmission season some transmission still takes place.

### Technical hazards

The Nairobi meeting considered some of the technical hazards which hampered effective malaria control in Africa. One problem was the sorbent capacity of different types of wall surfaces. It had been found that where walls were made of a mixture of materials, some of which were non sorbent, the effect of the insecticide was likely to remain for longer periods. Work was in progress to formulate an insecticide in such a way that sorption would be greatly reduced. Should this be successful, normal dosages of insecticide would be effective even on sorbent surfaces.

Another environmental factor which was the cause of some concern was the operation and in some cases the extension of large-scale irrigation schemes which contributed to the spread of malaria. It appeared that the control of mosquitos in irrigated areas

by standard methods tended to be less successful than under other conditions. In view of these control difficulties the meeting felt that irrigation schemes required the special attention of all authorities concerned.

In regard to vector control the consequences of residual insecticide spraying in areas where both *A. gambiae* and *A. funestus* were found received careful consideration. It has already been shown that *A. funestus* is virtually eliminated by spraying but although there is a great reduction in house resting *A. gambiae* adults the species can still be found breeding out of doors. A good example of this occurred in Mauritius where although *A. funestus* has been eliminated *A. gambiae* remains along the coastal areas where it is breeding freely. However it is found mostly in the open and appears to be a poor vector.

Although no morphological difference has been found between the outdoor resting and the indoor resting *A. gambiae* it is still impossible to say whether they are genetically distinct strains. In Southern Rhodesia 1000 female *A. gambiae* caught out of doors in a sprayed area were dissected but no infected specimens were found. The meeting was of the opinion that more work was required on the feeding habits and the vectorial role of the outdoor resting *A. gambiae*.

During the course of discussion references were made to large scale infestations of flies following dieldrin applications. Although it was possible that in some cases the infestation was more apparent than real nevertheless the meeting thought that it would be valuable in new antimalaria projects to include a fly survey as part of the pre-operational survey.

Interesting figures were put before the meeting of the efficacy of one annual spraying with dieldrin. Single hut experiments were described and these showed that the application of a nozzle dosage of 10 g/m<sup>2</sup> gave a very high kill for six months on sorbent surfaces and for up to 18 months on non-sorbent. With a nozzle dosage of 0.5 g/m<sup>2</sup> on less sorbent surfaces the effective period was six months.

Larval control was not considered as practicable in most rural areas in Africa although it had been found to be effective in the Union of South Africa. Larvicidal measures have however been widely used in African towns mainly for pest mosquito control.

In considering the use of drugs as a method of control for mass application pyrimethamine in a single dose was thought to be effective in the arrest of epidemic malaria. However examples were given of resistance of *P. falciparum* where repeated doses were administered. An interesting side effect resulting from the administration of pyrimethamine to nursing mothers was that by reason of its appearance in human milk a suckling infant could absorb even more than the appropriate therapeutic dose. Observations had shown that the administration of chloroquine or amodiaquine combined with

primaquine caused the complete abolition of parasitaemia.

### *Future possibilities*

Viewing the possibilities of effective malaria control in Africa the meeting adopted an attitude of cautious optimism. It was for example thought to be questionable that country wide control was possible where there were large areas of hyperendemic or holoendemic malaria. In South Africa campaigns had been carried out with great success. In West Africa the data available some years after control measures had been started showed that nowhere had there been complete interruption of transmission. In East Africa there was preliminary evidence to indicate that the Pare Taveta scheme in Tanganyika mentioned elsewhere in this article might be successful.

## ERADICATION OF MALARIA IN SOUTH-EAST EUROPE

Antimalaria campaigns aimed at eradication have been intensified in south east Europe with the following countries participating: Albania, Bulgaria, Greece, Romania, Turkey, the USSR and Yugoslavia. Representatives of these countries attended a Conference which was held in Belgrade from 26 to 29 March 1957 under the joint auspices of the WHO Regional Office for Europe and the Yugoslav Government. They noted the progress made since the last meeting in 1955<sup>1</sup> and discussed ways of attaining still closer collaboration between their respective countries in order to reach the final goal in the near future.

Despite the fact that malaria is receding in all the countries of this area as a result of the campaigns the time has not yet come to relax efforts: indeed as the Conference participants felt the indifference shown by health services and the population as a

whole to a problem which they no longer consider acute is a harmful attitude since this resistance it creates is difficult to overcome. The public—and occasionally the authorities—are inclined to lose interest in a disease which although it has not completely disappeared no longer causes the same suffering. One of the aims of the Conference was to highlight those questions still awaiting solution and to stress the need for speedy and energetic action in a spirit of full collaboration.

The following data give an idea of the progress made.

*Albania* (population 1.26 million). In 1956 751 cases were found (1221 cases had been confirmed during the first 10 months of 1955). On the basis of the examination of 30 000 children the spleen rate was found to be 4.4% and the parasite rate 0.01%. Cases are treated with mepacrine and plasmocide. At certain work sites in marshy

<sup>1</sup> S. Ch. n. *Wld Hlth Org* 1956 10 73

areas houses are sprayed with DDT and use is made of chemoprophylaxis. Spraying has been carried out not only where cases appear but also in places where the danger of infection seems probable.

**Bulgaria** (population 7.5 million). Only 761 cases were reported in 1956 (as against 667 during the first 10 months of 1955). Of these 186 were new cases and 75 were relapses. Case notification is compulsory as is hospitalization of sufferers and follow up in a clinic for three years. Anti relapse treatment in the spring and chemoprophylaxis have now become routine methods. The bipartite agreement with Romania has been helpful to Bulgaria and the tripartite agreement concluded with Greece and Yugoslavia justifies the hope that the few cases observed in the frontier areas will soon disappear.

**Greece** (population 7.9 million). In 1956 the prevalence of the disease reached the lowest level ever recorded. Nevertheless the figure of 680 confirmed cases is misleading and should be multiplied by four to give a rather more realistic picture. Fifteen of the 50 prefectures were free from the disease. The distribution of cases is sporadic (2.3 cases per positive locality). Sixty per cent of the cases occurred in the 0-15 year age group. The parasite rate among school age children was 0.02, and among infants it was zero.

**Romania**<sup>1</sup> (population 17.15 million). In 1956 259 malaria cases (189 confirmed) were reported in 92 localities with a total population of 786,000. 74 of these cases were relapses. Insecticides are applied by spraying the whole area by treating foci or by barrier spraying. Schizonto gametocidal treatment is administered for two years during the transmission period. The notification of malaria cases by name of patient has been in force since 1956.

**Turkey** (population 22.9 million). A draft bill on malaria eradication has been submitted

to parliament. As malaria was not a notifiable disease in 1956 no exact figure for the number of cases can be given. More than 200 doctors and 1330 public health workers are engaged in malaria control. About 7 million persons were protected by insecticide spraying in 1956. Malaria is no longer a public health problem but its eradication is considered essential and is indeed the aim of the 1957 programme.

**Union of Soviet Socialist Republics** (population 214.5 million). The prevalence of malaria has decreased steadily since the end of the Second World War when the annual number of cases was estimated to be more than 4 million. From 781,000 in 1951 this figure fell to about 12,600 in 1956. The few residual foci are situated principally in Azerbaijan, Tadzhikistan, Kazakhstan, Uzbekistan and Transcaucasia.

Treatment is compulsory and the patient is followed up at a clinic for two years. In the spring he is subjected to anti relapse treatment and during the transmission season schizonto gametocidal drugs are administered twice weekly. Only a few regions are covered completely by insecticide spraying. Towns situated on the banks of rivers are protected by barrier spraying and in sporadic cases selected foci (the patient's home and neighbouring houses) are sprayed. In areas where the silkworm is cultivated the walls of houses are left unsprayed but domestic animals are treated fortnightly since the anopheline vectors are essentially zoophilic. Prophylactic treatment is administered to gangs of workmen engaged in the construction of hydroelectric installations in particular along the Volga. In areas where such work is being undertaken the population is systematically examined and the cases found are treated. In this way sources of infection are eliminated before the artificial lakes are filled with water.

The delegation of the USSR informed the Conference participants that a new drug—"Chinocide"—derived from the 8-aminoquinolines and acting on the exoerythrocytic phase of *Plasmodium vivax* had just been

<sup>1</sup> See Ciugă, A. (1957) *Bull. W.H.O.* 15: 223 for detailed report on malaria in Romania from 1949-1955.

applied with success it considerably reduces the relapse rate. A certain quantity of this drug has been made available to countries which may wish to carry out therapeutic trials.

*Yugoslavia*<sup>3</sup> (population 17.27 million). The main foci still existing are in Macedonia and the oblast of Kosmet. As the vectors have not yet acquired resistance to DDT eradication seems possible in the near future. Since 1955 notification of cases has been compulsory. Treatment of sufferers which is free is also compulsory. However chemotherapy is only of secondary importance in the interests of eradication greater emphasis is placed on imagicidal treatment.

### Epidemiological surveillance

The task of an epidemiological surveillance unit is to carry out careful surveys for the detection, confirmation and treatment of cases. Experience has shown in fact that compulsory notification of cases and examinations in hospitals and clinics as well as those carried out by private practitioners and laboratories give only an approximate idea of the prevalence of malaria in a country except perhaps when the rural health services are very well developed. To be effective inspection must be made from village to village and from house to house. The members of the inspection team take blood samples and after microscopic examination administer drugs where necessary. The role of clinics and medical practitioners consists in following up the patients treated. On the average visits by surveillance personnel should take place three times monthly. Short term schedules are particularly indicated. The Conference noted with great interest the results of recent experiments which show that a single dose of pyrimethamine will remain in the blood for as long as 52 days in a concentration sufficient to prevent the further development of the

parasites in the body of the mosquito. This discovery if confirmed would be of the utmost value in eradication campaigns.

When eradication measures have reached a stage where only a few foci remain—a stage for which provision should be made from the outset—it is essential to have available insecticides of tested quality and to employ a scrupulously supervised and careful technique.

The elimination of residual foci by means of case finding may meet with certain difficulties. For example malaria may persist undetected in mountain villages. Generally speaking this is the benign tertian form, a non fatal infection in which relapses are rare. Since the parasite rate is very low haematological diagnosis can be established with certainty only by repeated thick film examination. Furthermore access to such foci may be difficult and examination on the spot as well as the distribution of drugs less easy than in the plains. Seasonal movements of the population in these mountainous areas may complicate the problem still further.

### Economic repercussions of eradication

Before the gradual disappearance of malaria as a public health problem countries in south east Europe suffered grave economic as well as social losses through the disease. The following examples provide good illustrations.

In 1936 the Yugoslav national economy lost nearly 8 million dinars solely on account of malaria. And this figure does not include the potential economic value of human lives lost to the country's economy owing to the effects of malaria on the birth rate.

Before the start of the antimalaria campaign Greece consumed annually one fifth of world quinine production. The sum spent every year was one and a half times greater than the annual cost of the present eradication campaign. Moreover if economic losses are taken into account the annual expenditure was eighty times greater.

<sup>3</sup> S. Smič, Č. J. R. ht. B] (1956) *B. H. Wild. H. H. O. g. 15*  
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## Susceptibility of the vectors

So far none of the countries of south east Europe apart from Greece has had to face the problem of the resistance of vectors to residual insecticides

It has been suggested that the data collected in the different countries on the "basic susceptibility" of the different vectors to the various insecticides should be centralized if possible under the auspices of WHO. These data which should be established by a uniform method—the Busvine Nash technique—and expressed in lethal concentrations ( $LC_{50}$ ) would make it possible to detect any change in the susceptibility of the vectors to insecticides. A standard method for the evaluation of resistance is being worked out under the direction of WHO.

## Conclusions

All the countries represented at the Conference have made considerable progress towards malaria eradication and the final goal seems likely to be attained within a limited time and under financial conditions acceptable to all the countries concerned. The Conference recommended each delegation to study suggestions concerning the maintenance by WHO of a central register of information containing material of interest to the health administrations of countries wishing to eradicate malaria in their territories. Such a register might include a list of

districts from which malaria has disappeared a list of those which are not yet free of the disease and from which it might be introduced into healthy areas as a result of the migration of population groups the presence of vectors their geographical distribution and their susceptibility to insecticides the presence of vectors—possibly resistant strains—near international airports.

The Conference expressed the wish that WHO through its Regional Office for Europe should undertake the work of co-ordination and exchange of information entailed in the carrying out of these suggestions.

Furthermore an appeal was made to the spirit of inter-country co-operation to ensure that the common aim of eradication is achieved by all the participating countries within approximately the same time i.e. from 3 to 5 years. An unfortunate situation would indeed be created if countries which had managed to eradicate malaria in their own territories were obliged to continue control measures for several years in order to prevent re-infection from their neighbour states where endemic foci were still present. In this connexion it was suggested that bilateral agreements should be reached between countries—if such arrangements were not already in existence—and that direct contact should be established so that close collaboration could be maintained between neighbouring states.

## Malaria

Nation-wide malaria eradication programmes can be successful only if the resources of the health administrations are fully mobilized and established time schedules are scrupulously observed. The advisory services of WHO have been increasingly geared to the task of helping countries to find the most efficient and the most economical patterns for their eradication work. It must be kept in mind that the Organization's contribution in providing guidance and advice will be useful only if the governments concerned ensure that the carefully planned programmes are implemented in a smooth and precise way.

## BCG VACCINATION PROGRAMMES, 1951-56\*

The WHO/UNICEF BCG vaccination programmes which were started in 1951 represent a world wide effort to combat tuberculosis. Within their framework countries in three continents have been assisted in carrying out mass BCG vaccination campaigns in accordance with a uniform pattern.

The campaigns are joint undertakings of the governments concerned WHO and UNICEF the responsibility for conducting the campaigns rests with the governments who also provide the field personnel WHO provides technical guidance assigning international staff to assist in organizing the work and to train national personnel UNICEF provides financial support including equipment and supplies for the campaigns.

In all campaigns a single intradermal tuberculin test with 5 TU is used to select persons for vaccination. The test is read at 3-4 days and those persons reacting with less than 5 mm of induration (in some countries 6 mm) are classified as non-reactors and vaccinated by the intradermal route. For testing a single tuberculin product is used<sup>1</sup> vaccine on the other hand is provided by different WHO approved BCG production laboratories<sup>2</sup>.

The results are recorded and tabulated in accordance with standard procedures laid down by the WHO Tuberculosis Research Office. The tabulations like the campaign operations follow the administrative divi-

sions of the countries. They include the total number of tests given tests read negatives and vaccinations in the three age groups 0-6 years 7-14 years and 15 years and over in some countries four age groups are used—namely 0-6 years 7-14 years 15-19 years and 20 years and over. Monthly statistical tabulations are prepared by the campaign headquarters and forwarded to the WHO Tuberculosis Research Office they form the basis of the statistical documentation of the programme.

Statistical reports of the work done up to the end of 1953 and 1954 respectively have been published previously<sup>3,4</sup>. The present report brings the statistics forward to the end of 1956.

Up to 1 January 1957 WHO and UNICEF have assisted the governments of 38 countries and territories with a combined population of about 775 million in carrying out BCG vaccination campaigns and altogether 162 million people have been tuberculin tested and 60 million vaccinated. From 1952 to the end of 1955 there has been a steady increase in the annual number of tests and vaccinations during 1952 the first entire calendar year of the programmes 14 million people were tested and 5 million vaccinated while the corresponding figures for 1953 were 25 million and 9 million for 1954 37 million and 13 million and for 1955 44 million and 17 million. In 1956 however the number of tests dropped to 38 million and that of vaccinations to 14 million.

Fig 1 shows the progress of the programmes month by month. The monthly figures reached a peak at the end of 1954 with 4.4 million tests and 1.6 million vaccinations. During the first quarter of 1955 the figures dropped to about 3.5 million tests and 1.3 million vaccinations. This level was maintained

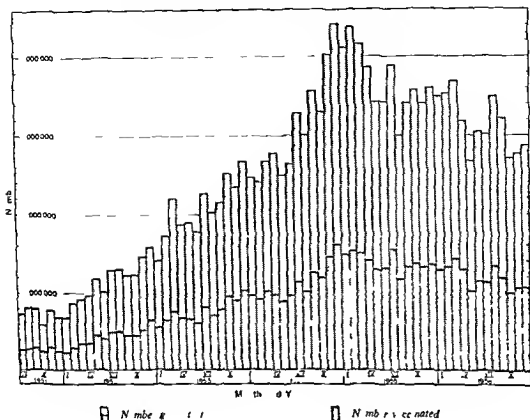
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FIG 1 NUMBER OF PERSONS TUBERCULIN TESTED AND VACCINATED WITH BCG IN WHO/ UNICEF ASSISTED CAMPAIGNS BY MONTH 1951-56



until the second quarter of 1956 when there was a further decline the number of tests falling to less than 3 million and the number of vaccinations to 1 million by the end of the year. This reduction reflects the fact that many of the large campaigns in Asia reached a maximum in 1954.

Table 1 gives breakdowns by continent and country of the number of persons tuberculin tested and BCG vaccinated in the programmes by the end of 1956.

By far the largest part of the work has been carried out in Asia. In this continent almost 151 million people have been tested in 21 campaigns compared with only 8.2 million

in the 13 campaigns in America and 3.2 million in the four campaigns in Africa. Thus the campaigns in the populous countries of Asia account for about 93% of the total of 162 million persons tested; the Indian campaign alone accounting for 49%, the Pakistan campaign for 12%, and the other 19 Asian campaigns for a further 32%. The comparatively very small scale of the American campaigns is due to the fact that they were conducted in small or thinly populated countries. The only exception is the Colombian campaign which accounts for about 58% of the total tested in this continent.



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L a b S t a t e s S r m n s t t t C o p n h g L a b o t o d I B C G  
C a S t a t e s S r m n s t t t C o p n h g L a b o t o d I B C G  
G a y a q I B C G P r o d t L b r a t r y K h K l g I n t t t  
o f P r t v M e d c e M d a s L a b o t o d I B C G M c o  
C i t y I n s t r u t P a s t e r P r i A l b g S r u m d V e c L a b o  
t o n e s R u z a l I n t t P r S g L a b o t r i o d e f B C G  
S n t a g d C h I B C G L a b o t r y P c I S r u m a n d  
V a c c i n e I n t t T a i p e I t t t P a t u r d I I a n T h r a n

B H W H H k O r 1955 12 301

C H W H H k O r 1956 10 126

TABLE I NUMBER OF PERSONS TUBERCULIN TESTED AND VACCINATED WITH BCG COVERAGE  
IN AGE GROUP 0-14 YEARS AND PERCENTAGE POSITIVE IN AGE GROUP 7-14 YEARS  
BY COUNTRY 1951-56 (cont'd)

Country	Camp g p iod	N mb of persons th sa ds				Co f ge- gro p 0-14 y rs (%)	P c t p p s b -g o p 7-14 y
		g t t	w th t t ad		vacc nat d		
			t-t f	t			
Americ (co t ued)							
S m s	D 1955-	108	95	5	55		30
T d d & Tobag	Ap 1 1952 M y 1954	3,3	3 1	212	212	78	4
Y d d l l a ds	J Ap 1 1954	60	58	40	40	78	16
C d							
A		150 8 5	122 275	54 947	54 431		
Ad C l y s	F b M 19 <sup>o</sup> J 1956-	42	31	11	11		53
Brun	Se L 19 <sup>o</sup> 2-On 1953	33	25	10	10 <sup>d</sup>	60	48
B rma	O 19 <sup>o</sup> 1	4 417	3 500	1 389	1 330 <sup>d</sup>		47
Camb d	F b 1953-	596	542	283	281		43
C r l b b	M y 1954-	1 860	1 59	780	760		29 <sup>b</sup>
Ch (T w )	M y 1951	4 683	4 154	2 682	2 680 <sup>d</sup>		41
H g K g	Ap 1 19 <sup>o</sup> Ap 1 1955	379	325	85	99 <sup>d</sup>	24	77
I d d	J ly 1951	79 233	63 196	28 005	27 610 <sup>d</sup>		
I d	Nov 195-	10 154	7 882	2 746	2 733		50 <sup>b</sup>
Ira	M y 19 <sup>o</sup>	1 708	1 420	995	920		24
I q d	A g 195-J 19 <sup>o</sup>	657	545	233	234	21	4 <sup>b</sup>
Jord	O 1953-	695	618	343	350		
M l ya, Fed rat n t	J n 1951-De 1953	689	617	329	3 9 <sup>d</sup>	22	43
West N w G a	M y 1956-	23	22	12	12		28
P t s s	J ly 1951	18 872	14 508	6 488	6 337		43 <sup>b</sup>
Philpp es <sup>d</sup>	O L 1951	8 055	6 954	3 353	3 357 <sup>d</sup>		49 <sup>b</sup>
waraw k	J ly 1952-O 1953	15	129	57	9 <sup>d</sup>	73	45
g po	J 19 <sup>o</sup> 1-O 1953	95	80	36	37 <sup>d</sup>	18	61
Th l d <sup>b</sup>	Nov 19 <sup>o</sup> 1	8 810	5 708	377	2 325		38 <sup>b</sup>
T key	J 1953-	11 159	10 229	4 29	4 475		
V t N m	Ap 1 1954-	749	648	245	2		57
Tot l		162 360	132 146	60 757	60 222		

**TABLE 1 NUMBER OF PERSONS TUBERCULIN TESTED AND VACCINATED WITH BCG COVERAGE IN AGE GROUP 0-14 YEARS AND PERCENTAGE POSITIVE IN AGE GROUP 7-14 YEARS BY COUNTRY 1951-56**

Country	Campaign period	Number of persons in thousands				Coverage of age group 0-14 years (%)	Percentage positive in age group 7-14 years
		give test	with test read		accinated		
			total	negative			
Africa		3 282	243	1 115	1 109		
Egypt <sup>b</sup>	July 1951-Dec 1952	2 269	1 476	654	649	18 <sup>c</sup>	33
Ethiopia & Eritrea Federation of	May 1953-Dec 1955	609	461	295	294	4	29
Libya	Feb 1953-Dec 1955	318	236	133	133	34	37
Sudan	April 1954-March 1955 Dec 1956-	86	70	33	33		43
America		8 253	7 628	4 695	4 682		
Barbados		81	72	39	39		47
British Guiana	March 1954-July 1955	208	192	111	111	65	35
British Honduras	Sept 1953-April 1954	48	46	23	23	75	30
Colombia	Sept 1954-	4 752	4 414	2 770	2 767		22
Costa Rica	March 1952-July 1954	263	248	198	195	44	13
El Salvador	Aug 1951-Nov 1952	349	312	183	179 <sup>d</sup>	21	24
Guatemala	July 1956-	695	632	319	370		21
Jamaica	Oct 1951-July 1953	635	586	349	348	5	19
Leeward Islands St Kitts	Nov 1953-Jan 1954	24	23	9	9	83	
Paraguay <sup>f</sup>	Aug 1954-	69	679	387	384		3

- not applicable

- data not available

<sup>a</sup> Coverage is defined as the number of tests read in the age group 0-14 years as a percentage of the general population in the same age-group. The general population 0-14 years of age is estimated by applying the age distribution for the entire country to the population figures for each subdivision at latest census and raising the resulting estimates by the percentage increase of the total population from the census to the mid-year nearest to the mid-point of the campaigns. The data are obtained primarily from the United Nations Demographic Yearbooks.

<sup>b</sup> Before July 1951 the following work had been carried out by the International Tuberculosis Campaign: Egypt 2 104 311 tests given 661 129 vaccinations; Ceylon 308 787 tests given 122 764 vaccinations; India 4 129 570 tests given 1 372 029 vaccinations; Pakistan 923 342 tests given 294 598 vaccinations. In Ceylon furthermore 827 516 persons were tested and 418 851 vaccinated under Government auspices between July 1951 and May 1954.

Based on results from the total campaign including the ITC programme

<sup>c</sup> The figures include some persons vaccinated without previous test

<sup>d</sup> The data include testing and vaccination of some persons who had already been vaccinated. In an earlier BCG vaccination campaign the percentage of positives cannot therefore be taken as an index of the prevalence of naturally acquired tuberculosis.

<sup>e</sup> Totals as of 31 December 1955

<sup>f</sup> Totals as of 31 August 1956

<sup>h</sup> The data include retesting and revaccination of some persons; the percentage of positives has been calculated on the basis of limited material excluding such data.

**TABLE II NUMBER OF PERSONS TUBERCULIN TESTED AND VACCINATED WITH BCG  
COVERAGE OF AGE GROUP 0-14 YEARS AND PERCENTAGE POSITIVE IN AGE GROUP 7-14 YEARS  
BY CIVIL DIVISION IN CAMPAIGNS COMPLETED DURING 1955-56**

Country and	Number of persons				Coverage of 0-14 years (%)	Percentage positive 7-14 years
	Total	with test		vaccinated		
		total	positive			
<b>British Guiana</b>	207,733	191,731	111,400	111,325	65	35
Cott						
Bartolome	55,374	49,496	78,972	28,908	67	38
Demerara	126,777	118,919	69,006	68,972	67	33
Essequibo	25,582	23,316	13,472	13,445	63	40
<b>Federated Ethiopian</b>	609,321	460,715	294,781	234,300	4	29
<b>Ethiopia</b>	3,5730	766,757	176,297	176,030		
<b>Pakistan</b>						
Addis Ababa	95,610	70,921	38,527	38,446		41
Aru	16,823	11,967	6,737	8,734		23
Bhimmed	19,276	15,907	10,902	10,900		8
Gadim	10,072	8,458	6,795	8,793		6
H	7,213	5,222	26,984	26,939		24
K	23,713	15,810	8,834	8,730		40
Shoa	60,990	45,234	29,356	29,334		22
Sd m	18,571	14,909	10,630	10,684		22
T	36,311	27,570	18,632	18,630		22
W	9,990	8,131	6,076	6,076		22
Wilo	9,277	1,718	10,725	10,716		22
<b>Egypt</b>	223,91	173,958	116,44	118,270		21
<b>Pakistan</b>						
Akai-G	32,332	28,565	72,096	22,096		20
A g d t	19,173	5,800	11,314	11,314		22
Ch	22,620	8,779	12,944	12,942		20
H m	25,799	19,107	16,008	16,008		20
Amarat w	3,465	48,334	25,613	25,407		28
R d S	21,207	15,094	7,407	7,407		28
Sera	34,008	27,619	23,177	23,101		15
<b>Hong Kong</b>	378,977	376,372	85,942	93,548	24	77
<b>Dutch East Indies</b>						
V t l i d	230,914	199,958	48,471	57,786		77
K w Loo	15,670	167,159	31,184	32,443		77
N w t mt	3,188	22,255	8,477	8,554		73
<b>Iraq</b>	657,331	545,470	238,086	234,153	21	48
<b>Pakistan (L w)</b>						
Am n	16,937	13,476	5,653	6,845	6	40
A b i	11,443	9,840	5,077	5,000	8	41
Baghdad	305,865	258,184	109,948	100,346	60	53
Ba rah	9,979	73,862	32,363	37,043	79	40
D i h	36,235	31,062	15,137	15,082	18	34
D w y ah	32,508	76,817	0,660	10,627	12	51
D i m	78,071	26,036	5,766	15,622	75	33
H t h	18,721	17,300	8,142	8,117	13	41
K b i h	17,871	14,489	5,069	5,051	10	81
K k k	28,006	4,211	1,022	10,980	14	43
Kut	24,007	17,139	8,268	8,235	13	46
M i	9,096	8,361	4,464	3,826	3	35
M t f g	17,956	1,433	6,983	6,964	8	46
S i m a y h	12,941	0,400	5,361	5,347	9	41
<b>Libya</b>	3,8071	236,294	33,334	132,812	34	37
Prov						
Cy	83,856	7,700	36,844	36,767		38
F	32,244	25,275	5,970	15,523		29
T o l t	1,8971	133,778	60,52	83,542		37

w dat not il bl  
 See T bl f t t f )  
 i l d i g 12,983 w b i l d with t p e v l t t  
 Th d t l i d r e t a t g d a t f m p r e t h p c e l g f p i t v e h b e e c a l l a t d  
 th b l i m i t d m t l a l i d g h d t

A common problem was that a more or less substantial proportion of the persons tested failed to return for the reading of the test (see Table I). Out of the 162 million persons given a tuberculin test about 19% were lost to the campaigns through failure to return. This percentage varied considerably among countries in the American campaigns the loss ranged from 4% to 12% and in the African and Asian campaigns from 2% to 27% although in Egypt it reached 35% the vaccination on the other hand was almost complete practically all persons found tuberculin negative were vaccinated the percentage for the entire programme being 99.1

An analysis of the age distributions of the population tested in the 17 countries where the internationally assisted campaigns have been completed shows that on the average 20% were under 7 years of age 39% were 7-14 years old and 41% were 15 years or over the distribution however varies considerably from country to country. In several countries and territories both in America and in Asia more than half those tested are aged 15 years and over (in Brunei for example the proportion is 56% and in Jamaica and British Honduras 53%). In other countries chiefly in Asia the age group 7-14 years predominates (in Iraq 56% were of this age group and in Malaya 65%) in these countries the campaigns have apparently been largely conducted in the schools.

The distribution by age of the vaccinated population was on the average as follows under 7 years of age 32% 7-14 years 46% 15 years and over 22%. The vaccinated population is thus on the whole younger than the tested. The reason for this is that the proportion of persons eligible for vaccination among the tested population decreases with age on the average the proportion eligible for vaccination was 86% 61% and 28% respectively in the three age groups.

The purpose of the mass campaigns is to cover the populations in the areas where such projects are initiated by tuberculin testing as many people as possible within specified age groups and vaccinating with BCG the

non reactors to tuberculin. A measure of the success of the campaigns in this respect would be the proportion tested within the specified age groups (the "coverage"). Table I shows the coverage of the child population (0-14 years) for the 17 countries where the campaigns have been completed. The figures have been computed by relating the number of children with test read to the total number of children aged 0-14 years. In 7 countries less than a third of the children under 15 years participated in the campaigns in one country (the Federation of Ethiopia and Eritrea) the proportion was as low as 4%. A coverage of 75% or more was achieved in 4 countries all in the Americas.

An attempt has been made to obtain some indication of the prevalence of tuberculous infection in individual countries by computing the proportion of tuberculin positives among the school age children (7-14 years) with test read (Table I). The age group 7-14 years was chosen because it is the one best covered furthermore the age composition of this group may be assumed to be rather uniform from country to country.

The frequency of positive reactors is seen to be comparatively low in the American countries ranging from 13% in Costa Rica to 35% in British Guiana a single exception is Barbados where the positivity rate attained 47%. In the four countries on the African continent the percentages are also relatively moderate—namely 29% to 43%. In Asia on the other hand the frequency of positive reactors is generally high reaching 77% (Hong Kong) and exceeding 40% in all but three countries (Iran, Ceylon and Thailand).

The percentage positive figures should be interpreted with caution however. Results from tuberculin surveys conducted with uniform techniques in widely separated areas<sup>2</sup> indicate that in addition to the strong specific tuberculin sensitivity found everywhere there occurs in many parts of the world a low grade non specific sensitivity to tuberculin. In areas where this non specific sensitivity is widespread the efficiency of the

# WORLD HEALTH DAY 1957

World Health Day was observed throughout the eighty eight Member and Associated Member States of WHO and in all the Member States of FAO on 7 April. This year for the first time since its inception World Health Day was the concern of two organizations—WHO and FAO—as the theme “Food and Health” was of equal importance to both. The two specialized agencies work in close collaboration on a number of common projects and the World Health Day theme provided a good example of how the work of the two organizations is inter linked.

As in previous years National Health Administrations and local Health Authorities used the occasion of World Health Day to underline the importance of health needs and to stimulate the people's co operation in health action. The double message in this year's theme and the fact that it was sponsored by both FAO and WHO resulted in an even wider observance than in the past.

To give an indication of how the theme was treated in the various special messages which were issued on the occasion of World Health Day the following passages have been extracted from them.

It I th k I ar th t the rel t n bjt betw n  
f d nd h lth h b m a ry l se nd  
tri t ne nd th t w n o l nger  
l t u l b gud d mply by th  
e u m d b l f f arh g n t n  
Th re n f th w l l n untry and  
n cultur wh h tod y n ff d t gl t  
th c n t f t h g now a l b l n  
n trit n f d val n nd th t h nqu of  
prod c n d p o c n food

\*\*\* D M G C A t t Dir t Gen al WHO

Th ph m rry h alth d or culru x  
f st d t th Le f N t A emply  
i 193 d r i d b t t r t It is  
ke v ph d t d t lly h r t  
f th b p pl huch i d t th t M h  
ment f FAO Cl ly th bject f food  
f h lth t b t d f th  
ce ry food p o d ced ffect t  
m i d peopl ar bl t oht them  
If th th f d p d n t t der bl  
degr th de c lopm t f aer ult d  
her I m v l l d f i her f i h  
al ble food which ffect ly ppl m t  
the mb l ed d t h acterist f m y  
ntr

\*\* B R SEN D ect G er I FAO

Th re l mpelli g r son why f th  
m j rity f pe pl th gh t So th Ea t  
A mpo t n t t m sh uld n t be  
a l hl d qu t m t T k thre  
mpl Th ml from tre th t  
fl h n h t w ll cool

hully tr et alr dy wid ly used as  
c d m n t n th f r m f p e r s e r v e s t  
m ly d to be m re ut blv prepar d  
n en b t n w Ru so dlv  
mstr t d by being pol h ed t th t dpl  
f d f m l l n t d m a n d n l v t b  
j y e d m n ar ly n ture prov d e t  
Th p p v which thrives al m t anywhere  
c nld w th ase be gr wn r v a l l a b l  
p t f ground t m h t th n becomun  
m e p l n t l l than t a s t l y t k t  
n h f u l p l n th d u t f e r y family  
t t t l c o t. All th things re c m  
ally quite f a b l d c a t r o d d  
o nld be n t n e d r y h ply

Th u t clear th t f o d f h alth t  
f t n a s m u h a p r o b l m f e d u t n a s f  
n m u T e d u t t h w m a f a r  
m than m e r e l v t a f r m c m p l y t t l l  
p e p l th t h y h u l d o h u l d n t t  
r t a i n f o d d t h t t h e v h u l d h n l d  
n e f e d th m t th r h u l d n h y n  
m n g h f t m m n h u m  
t r a n t c l m n t f o o d h a b t l r n t e a r l y m  
l f n d m t f u s d n t r e d i l y c h a n g  
m h h a b t r n h t

H alth edu a t i n f b e t t n u t r i t i n  
n n g m th d w h u h w i l l t a h p e o p l t o  
n j th f o o d t h y e e d r a t h e t h a n m r e l y  
t l l g t h m w h t t h y g h t t t m t  
th f r e b e r e g n e d a l g r a n t k  
f th u t m t m p o r t a n t I d e e d t h r e  
w u l d r e m t b e r y r e s o n t o g i t t h i s  
k u n d f n t r i t n e d t m u h h i g h  
p r i r i t y t i n g n s c h m e s f n u a l  
d l p m n t h a n t h o l d t o d y f o n l y  
th n c a n b e g i n t m k s u r e t h t n f u t u r e  
o u r p e o p l h a l l h e n t n l y h f o o d

TABLE III NUMBER OF PERSONS TUBERCULIN TESTED AND VACCINATED WITH BCG BY AGE IN CAMPAIGNS COMPLETED DURING 1955-56

Country	Number of persons with test read				Number of persons vaccinated			
	Age groups (years)			Total	Age groups (years)			Total
	0-6	7-14	15 and over		0-6	7-14	15 and over	
British Guiana	45 452	71 445	74 834	191 731	41 187	46 127	24 011	111 325
Ethiopia & Eritrea Federation of	111 188	164 974	184 503	460 715	98 601	116 738	78 961	294 300
Hong Kong	74 216	140 966	111 190	3 6372	60 005	32 888	5 695	98 588
Iraq	57 420	306 698	181 302	545 420	44 914	155 761	33 478	234 153
Libya	6 839	93 529	85 916	236 284	45 096	9 051	28 665	13 812
Total number	345 115	777 612	637 795	1 760 522	297 803	410 465	170 810	879 178
Total %	19.6	44.2	36.2	100.0	33.3	47.1	19.6	100.0

tuberculin test is seriously reduced as the largest non specific reactions are indistinguishable from the smallest specific reactions. The percentages of positive reactors for such areas will therefore include a certain often fairly high proportion of persons with strong non specific reactions and will thus produce a tendency to overestimate the frequency of tuberculous infection. Obviously the occurrence of non specific sensitivity also interferes with the selection for vaccination of uninfected persons with strong non specific reactions will be excluded from vaccination. The problem may be solved to some extent by raising the limit for what is to be considered a positive reaction. In BCG campaigns this would mean that fewer uninfected persons would be excluded from vaccination at the expense of some increase in the proportion of infected persons that would be vaccinated. This solution was adopted in some of the WHO/UNICEF assisted campaigns. Thus late in 1955 and at the beginning of 1956 the criterion for a

positive reaction was raised to 10 mm in Cambodia, Burma and China (Taiwan) and to 8 mm in India and Thailand.

More detailed statistics for the five BCG vaccination campaigns completed in 1955-56 are given in Table II (by administrative division) and Table III (by age) corresponding breakdowns for the campaigns completed during 1952-54 have been given in previous reports.<sup>7,10</sup>

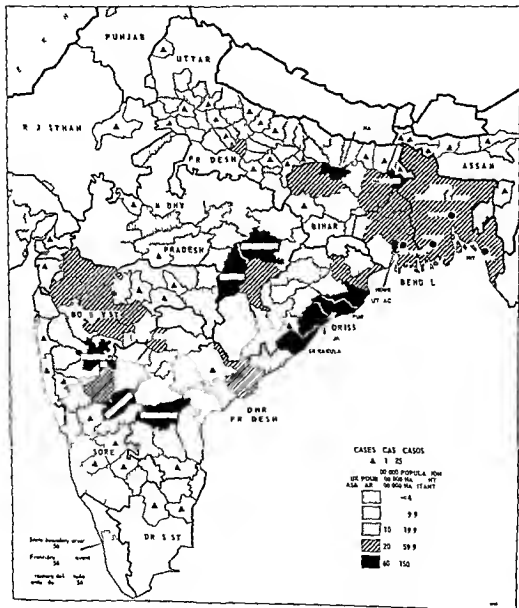
It appears that the percentage of persons not completing the test, the age distribution of tested and vaccinated and the coverage of population all vary as much within the countries as between the countries. Similarly the frequency of positive reactors shows considerable variation between localities. These within country variations should be interpreted as cautiously as the inter country variations; the prevalence of non specific sensitivity may well be high in one part of the country and low in another as has been found in India and Pakistan.

Since a high prevalence of specific tuberculin sensitivity has been demonstrated by WHO/UNICEF BCG assessment teams in a number of territories where BCG campaigns are in progress, viz. Burma, Cambodia, South India, East Pakistan, the Philippines, Sudan, Taiwan, Thailand and Viet Nam.

M BCG 1st Egypt 1949-52 with p.i.f.  
at 1st BCG 1st India 1949-52 with p.i.f.  
by Copehagen, 1953  
B H W J H H O F 1954 10 113  
B H W J H H O F 1955 12 301  
Chr H H H H O F 1956 10 126

# CHOLERA IN 1956

Nearly 66 000 cases of cholera were notified in India and East Pakistan in 1956. This total which accounted for just under 100% of all officially notified cholera cases in the year is higher than that recorded for the same areas during the two preceding years.





but also enough of the right kinds of food for health strength and a more abundant life

\*\*\* Dr C MANI WHO Regional Director for South East Asia

"Thanks to the discoveries of science which has advanced more in the last 50 years than in the previous 2000 years we now have the knowledge and the power to produce sufficient food measured on a health standard for more than twice the population of the world and also to eliminate or control most of the killing diseases

"Where this new knowledge has been applied the expectation of life has been extended. By 1900 it had reached 50 years. For many children born today it is about 70 years

But this knowledge has not yet been applied to the whole human family. At birth the expectation of life of 1/3 of the people in the world is only 30 to 40 years. Thus 1600 million people suffer premature death (often in infancy) from disease which can be prevented and lack of food which can be provided

"This is a challenge to our civilization"

\*\*\* Lord Boyd Orr

"Recent work suggests that death from heart disease is closely linked to the over eating of fats particularly hard fats which have tended to represent an ever increasing proportion of the diet of prosperous Western nations

Thus it may appear that one part of the world is still suffering from hunger and malnutrition while another part literally eats itself to death

"Prevention of the e two extremes entails greater understanding on the part of both individuals and of governments of sound nutrition of nutrition education and of nutrition planning"

\*\*\* Dr JEAN MAYER Associate Professor of Nutrition Harvard School of Public Health Boston USA

"A discussion of food superstitions and taboos—also cultural phenomena—could require a volume to itself with illustrations drawn from all types of human society civilized and primitive. Dr Cicely Williams who introduced the word kwashiorkor into medical literature writes<sup>2</sup>

In East Africa where kwashiorkor is also commonly common there are places where meat

and milk are available but the women and children do not get them. The women are told that if they eat eggs they will become sterile if they eat fowls they will cross if they eat goats they will grow beards

"These are extreme examples but there would be no difficulty in finding less picturesque ones nearer home

"Food production processing and transport stage levels food prices—all these are a by one side of the picture on the other are human beings and their incalculable behaviour

\*\*\* Dr W R AYKROYD Director Nutrition Division FAO

"There is no easy road to better health for the children through better nutrition. Parents throughout the world need help to break the vicious circle of malnutrition—disease—poverty and still more severe malnutrition

"Research workers can pursue the scientific facts on which sound action can be based. Government authorities can do their part to facilitate the development and better use of local resource

"But unless each individual in the community is prepared to accept the adventure of new ideas and new ways little can be accomplished. All over the world however people are setting out on that adventure and progress is being made more rapidly than ever before in man's history

\*\*\* Dr R BURGESS Chief Nutrition Section WHO

Dr J BIFRMAN Chief Maternal and Child Health Section WHO

"It is evident that the need to bridge the gap between the developed and less developed regions by raising the levels in the latter will be the main feature of the world food problem for some time to come

Since movement of foods from surplus to deficit areas is hampered by serious economic and other obstacles the objective can best be achieved by increasing local food production in the underfed areas. The required increases in these areas will however call for much greater efforts than those envisaged at present in most of them

"It is probably justified to say that in the foreseeable future the world can feed its increasing population even at modestly higher levels of nutrition provided that the problem is faced now and that the necessary efforts are made by everybody concerned"

\*\*\* Dr K K P N RAO Chief Food Consumption and Planning Section Nutrition Division FAO

more limited studies however have produced figures which suggest that the civilian population rate may be substantially less

Other factors in the pathogenesis of rheumatic fever may be environmental conditions heredity and nutrition much further work is necessary before the true significance of all these factors can be established

### Advantages of penicillin therapy

While the use of sulfonamide administered orally for the prevention of rheumatic recurrences in known rheumatic patients has repeatedly proved its effectiveness—and has the additional advantage of low cost—penicillin administered by mouth or by injection has proved more effective and moreover less toxic. It is stressed in the report that sulfonamide treatment of streptococcal infections has been quite ineffective in the prevention of first attacks of rheumatic fever presumably because it is unable to eradicate streptococci from the upper respiratory tract. Penicillin on the contrary has been proved effective for this purpose as for example in young adults in military populations where early treatment of the streptococcal pharyngitis or tonsillitis with therapeutic dosage of penicillin for at least 7-10 days was successful.

There is no method for preventing streptococcal infections in the population at large. In small closed or semi-closed communities such as schools children's homes institutions and camps however epidemic control has been possible through chemoprophylaxis and carrier isolation. Again in the case of excessive exposure such as occurs in the wards of hospitals epidemic control is simple. Here the aim of penicillin prophylaxis should be to maintain high and constant blood levels throughout the period of exposure. A possible schedule might be double the dosage recommended in the report for continuous prophylaxis in a rheumatic fever patient.

The report advocates that nurses social workers and other personnel in hospitals and institutions should be instructed in the danger to the rheumatic patient of strepto-

coccal infection and in the early protective measures that need to be taken. Also the hospital administrator should be made aware of the benefits of a preventive programme from the standpoint both of the patient and of economy in hospital services through the prevention of recurrences. Measures should be taken to ensure that adequate supplies of penicillin are available for all rheumatic patients regardless of economic status.

### Prevention of rheumatic fever relapses

The prevention of recurrences in known rheumatic fever patients likely to result from casual exposure to streptococcal infection under ordinary conditions of life is much more difficult. Continued prophylaxis is deemed necessary for long periods of time in individuals who usually feel perfectly well and its success depends on *inter alia* clearly established diagnosis of rheumatic fever according to generally acceptable criteria assistance of the public health services to ensure continuous medical surveillance and continuance of prophylaxis throughout the year despite the seasonal occurrence of streptococcal infection.

The choice of the prophylactic agent for the individual patient and the method of its administration is left for the physician to decide. The report gives suggested drug dosage schedules for continuous prophylaxis and for treatment of streptococcal infections.

In the case of a known rheumatic patient developing a superimposed streptococcal infection early intensive treatment with large doses of penicillin over a ten-day period is recommended.

In isolated cases of streptococcal infection in the community the physician should be able to institute effective treatment by penicillin and thus prevent first attacks of rheumatic fever. Attention is drawn specially to the importance of prolonging treatment for 10 days to ensure eradication of the streptococcus.

The report concludes that if known rheumatic subjects are not allowed to develop infection with the haemolytic streptococcus they will not develop rheumatic fever relapses.

(32 000 in 1955 and 36 000 in 1954) but well below the annual average of 160 000 cases recorded officially over the period 1949-53. This information is contained in a brief note on the world cholera situation which appears in a recent issue of WHO's *Weekly Epidemiological Record* (No. 16 1957).

The accompanying map shows the cholera incidence in 1956 by districts of India based on provisional notifications. As can be seen the highest rates—apart from the endemic areas of East Pakistan and West Bengal—were recorded in the districts of Patna in Bihar, the coastal areas of Orissa, in the Bilaspur and Durg districts of Madhya Pradesh and the districts of Sholapur, Raichur and Kurnool in the southern Deccan area.

## Reports of Expert Groups

### PREVENTION OF RHEUMATIC FEVER

The second report of the Expert Committee on Rheumatic Diseases, which has just been published<sup>1</sup>, reviews the problem of the prevention of rheumatic fever and makes practical recommendations which may serve as a guide to the future development of national and local rheumatic fever prevention programmes.

At the outset definitions of rheumatic fever and of chronic rheumatic heart disease are given in order to clarify the terms used in the report. The importance of rheumatic fever is held to be its liability to give rise to permanent heart disease.

Exact statistics on the prevalence of rheumatic fever and rheumatic heart disease are not obtainable at the present time. The existing sources of information are mortality statistics, statutory reporting or notification surveys of healthy persons and statistics on hospital admissions. The element of personal judgement on the part of the individual medical practitioner introduces an uncertainty into most of the figures thus obtained.

Mortality statistics cited in the report show that in persons under the age of 35 cardiovascular diseases, excluding congenital defects, account for 3.5% of all deaths. In this age group rheumatic heart disease is believed to be the only significant cardio-

vascular cause of death, apart from congenital defects. Surveys of schoolchildren in the USA and Italy have shown that a proportion of 1.2% have heart lesions indicative of a previous rheumatic attack. Similar rates were found among men drafted into the US armed forces. Hospital admission statistics from widely dispersed parts of the world also show a proportion of 1.2% of acute rheumatism and chronic rheumatic heart disease.

The best method of obtaining further information is deemed to be by means of properly designed pilot population surveys, but in view of the expenditure that would be entailed this is recommended only as a research procedure.

#### Studies on streptococcal infections

Infection with group A *haemolytic streptococci* is now recognized as the only established causative factor in acute rheumatic fever. Clinical observations, epidemiological studies and laboratory evidence are available in support of this belief. The demonstration that the use of antibacterial drugs prevents recurrences of rheumatic fever and that antibiotic treatment of streptococcal sore throat can prevent first attacks of the disease constitute further evidence.

Extensive studies in a large military population have indicated that 3% of acute streptococcal infections of the respiratory tract are followed by rheumatic fever. Other

America Great Britain and Finland are more prone to die of ischaemic heart disease than are men of the same age in Norway or Denmark and that they are also several times more prone than are men in Italy or Portugal. Other comparisons reveal even greater disparities. The report states that such differences could possibly be genetic in origin but if on the other hand it should be that they were mainly due to differences in ways of life this would open up new lines of investigation which might disclose major causative factors of atherosclerosis and ischaemic heart disease.

Another point referred to in the report is the relationship of the incidence of ischaemic heart disease to sex differences. Investigations which have taken place in the USA Great Britain and Sweden have shown a pronounced difference in mortality from myocardial ischaemia between the two sexes in the age group 40-59 years—males showing a considerably higher mortality than females. In the USA where ischaemic heart disease is frequent the ratio of male to female deaths is very high in young persons and diminishes after the menopause. However in Italy and Portugal where the disease is not so frequent the disparity in frequency between the sexes is smaller.

Apart from differences in mortality the course of the disease may itself differ between the sexes and males will suffer a more dramatic and rapidly fatal development. These facts emphasize the importance of giving due consideration to the sex ratio in epidemiological investigations. Although sex differences are striking interpretation of the variations is difficult as men and women live differently in many ways. Consideration must therefore be given not only to sex-linked inheritance and to differences in endocrine factors such as androgen and oestrogen levels but also to the possible effects of differences in environmental factors such as physical and mental activity emotional strain diet and the use of stimulants and intoxicants.

The association between metabolic influence and the prevalence of atherosclerosis

and ischaemic heart disease has already been established. Clinical observations have shown that a number of endogenous metabolic disorders can predispose to atherosclerosis. For example it is well established that atherosclerotic disease is now the chief cause of death in diabetes. Significantly the incidence of and mortality from diabetes tended to fall in parallel to the sharp drop in the death rate from ischaemic heart disease observed in certain countries during the Second World War.

### Role of environmental factors

It is clear that a relationship exists between certain aspects of day-to-day living and the incidence of ischaemic heart disease. Considerable evidence has accumulated to suggest that diet is a factor which is directly or indirectly influential. Research carried out with animals has shown that dietary manipulation can produce atherosclerosis in various species although it has not yet been possible to produce the equivalent of human ischaemic heart disease. However the results of some experiments in which aspects of ischaemic heart disease were simulated have shown that dietary factors play a most prominent role.

The report mentions various items of information which point to the significance of diet as an initial factor. They are the war time changes in mortality rates of ischaemic heart disease in countries where people were forced to change their diets; the difference in frequency of atherosclerosis and myocardial infarction among peoples subsisting habitually on different diets; life insurance data relating to persons of different relative body weights who are presumed to have different dietary habits and perhaps indications of a progressive rise in ischaemic heart disease in younger men in countries where there have been progressive changes in the character of the diet. Although it could not be said that the diet is isolated as the only independent variable in the examples given nevertheless the appearance of a consistent dietary pattern does suggest that it is of particular significance.

Moreover attacks of rheumatic fever may be prevented if all infections with the haemolytic streptococcus are recognized and treated promptly and efficiently so as to eradicate the micro organism with as little delay as possible

Much well controlled research is needed to find effective methods of early streptococcus case finding on a community wide basis and the school health service may serve as a useful screening device for this purpose

Although the form of a rheumatic fever prevention programme in any individual country must depend on the relative importance of the disease it is felt desirable that

everything possible should be done to protect individual cases. Hence it is advocated that some form of efficient prophylaxis should be instituted for persons known to have rheumatic fever or chronic rheumatic heart disease and that all recognized cases of acute haemolytic streptococcal infection should be given adequate treatment with penicillin. Nevertheless before submitting a patient to a prolonged period of prophylactic treatment the diagnosis of rheumatic fever should be made as precisely as possible and the Jones criteria (modified) are advocated for this purpose

These criteria are reproduced in an annex to the report

## ATHEROSCLEROSIS AND ISCHAEMIC HEART DISEASE

The rising mortality from ischaemic heart disease is one aspect of the general problem of atherosclerosis which is of growing concern to public health authorities. Accordingly the WHO Study Group on Atherosclerosis and Ischaemic Heart Disease which met in Geneva from 7 to 11 November 1955 decided to focus its discussions on this question. The report of this group which has recently been published<sup>1</sup> discusses the present status of knowledge of the etiology and pathogenesis of atherosclerosis and ischaemic heart disease and advises on means of broadening this knowledge so as to provide a basis for effective prevention work.

Ischaemic heart disease is defined as the cardiac disability acute and chronic which arises from reduction or arrest of blood supply to the myocardium in association with disease processes in the coronary arterial system. The two main pathological processes involved are atherosclerosis of and thrombosis in the coronary vessels. Atherosclerosis includes several quite distinct intimal processes such as fatty changes

fibrous thickening fibrin incorporation and calcification. In ischaemic heart disease—the end product of atherosclerosis—multiple causative factors must therefore be considered. These multiple factors may operate differently and thereby produce different pictures in individual cases and in the disease as it occurs among various ethnic and social groups.

### Role of constitutional factors

The factors involved in the origin of atherosclerosis and ischaemic heart disease are of two kinds—namely those arising from heredity and those occurring in the environment. They are not always easily dissociated and comparisons of morbidity and mortality in different races and social groups often embrace both kinds of factor. The problem is to ascertain how far heredity is a determining factor or whether it is overborne by environmental factors.

A striking characteristic of ischaemic heart disease is the great variation in its incidence and mortality in different populations even when allowance is made for age distribution. It has been reported for example that middle aged men in the United States of

America Great Britain and Finland are more prone to die of ischaemic heart disease than are men of the same age in Norway or Denmark and that they are also several times more prone than are men in Italy or Portugal. Other comparisons reveal even greater disparities. The report states that such differences could possibly be genetic in origin but if on the other hand it should be that they were mainly due to differences in ways of life this would open up new lines of investigation which might disclose major causative factors of atherosclerosis and ischaemic heart disease.

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However several different aspects of the diet have to be taken into consideration. For example the first item to be considered was dietary cholesterol almost 50 years ago this was shown to be capable of producing atherosclerosis in the rabbit. It is now known that various animal species differ markedly in their response to cholesterol contained in natural foods or added in pure form to the diet. Man differs greatly in this respect from the animals used for experimental purposes and it now seems that provided conditions are constant the blood cholesterol level in man usually responds little or not at all to variations in cholesterol intake corresponding to the range represented by the great majority of human diets.

With regard to the question of dietary fat the Study Group considered it possible that the statistical excess in mortality from heart diseases in overweight people was not related solely to excessive calorie intake but to an unduly high intake of certain fat ingredients particularly certain types of fats which in the more technically developed countries are present in considerable quantities in rich diets. It is of considerable interest that among the various populations which have been studied the incidence of atherosclerosis and ischaemic heart disease is relatively low in those groups which subsist on a low fat diet. Examples of such groups given in the report are the male populations of Japan, Korea and Okinawa, the Bantu in Uganda and South Africa, the Mayan Indians of Guatemala, the Yemenite Jews, the Indonesians, the tribes in Nigeria, the Bolivians and Peruvians and the inhabitants of southern Italy and Sardinia.

Evidence of the same trend was to be found in the war time changes in mortality ascribed to ischaemic heart disease in some countries. Generally speaking these changes followed a reduction in the amount of fat in the diet and were observed to be greatest where the reduction was at its maximum. Not only did mortality from ischaemic heart disease fall a year or so after subsistence on a low fat diet began but the converse was true following the restoration of fat in the diet. As the

fat content of the diet is today increasing in many parts of the world the importance of discovering the effects of fat consumption is obvious.<sup>2</sup>

Data on actual food consumption including fat intake in different countries are far from adequate and do not serve to show what may be the dietary customs of different groups within a nation. In this connexion the co-operation of FAO in obtaining data on food consumption will contribute to further progress.

### Calories, obesity, and overweight

One of the dietary factors which may bear on the incidence of ischaemic heart disease and which has attracted the greatest general interest is that of the imbalance reflected in relative obesity or overweight. The report of the Study Group draws attention to the fact that the terms obesity and "overweight" are not synonymous. Relative obesity refers to the proportion of the body mass composed of fat and obesity means that the proportion of fat in the body is unduly large. Overweight refers simply to the state of being above the average or standard for one's height, age and sex. The truly obese person is likely to be one who shuns physical activity in addition to overeating so that his body weight is no accurate measure of his fatness.

Evidence indicating the importance of obesity in regard to heart diseases is very largely derived from statistics in which the variable is actually overweight. There is no convincing evidence that relative obesity by itself is a major factor in atherogenesis or in the production of ischaemic heart disease in man. Other evidence which suggests that obesity in itself is not a primary factor in producing ischaemic heart disease has come from population studies. Obesity is not uncommon in many countries where there is

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p o r t h o l d t t g r e c o m m e n d t f r e s e r c h i n  
t h f i l d A d a n c e k w l d g r l t g f m r e c e n t w k m y  
b e f c d e r b l p t t l p b l h t h i m p o t n c e F r i e t e r  
s e h m y p r m t o f t h d l p m e n t o f l y a p p l a b l e  
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far less ischaemic heart disease than for example in the USA and Great Britain. Calculations which have been based on life insurance data show that if all markedly overweight persons were removed from the USA the mortality rate from ischaemic heart disease in the remainder would still be very much higher than in some other countries—for instance Norway Italy and Japan—despite the fact that obesity in these latter countries is by no means a rarity.

Linked with the question of obesity is the theory that physical activity is an important determinant in the etiology of ischaemic heart disease. This as the Study Group points out, has by no means been proved. Some evidence does suggest that men whose occupations do not demand a high degree of physical activity tend to suffer from ischaemic heart disease more frequently and more severely than their counterparts in more active jobs. However other evidence is contradictory and it should be borne in mind that variations in the level of physical activity are generally associated with variations in other aspects of day-to-day living notably in dietary habits.

It is a popular belief that psychological factors such as stress strain and mental tension play some part in the genesis of ischaemic heart disease. As the Study Group takes pains to point out this belief appears as yet to have no scientific basis. However the greater incidence of the disease in highly organized communities than in those of a more simple character has been attributed to differences in the tempo of life relation between the sexes social insecurity and striving for dominance—all of which have their repercussions on the emotional life of individuals. In this connexion it was felt that more systematic research into cultural and psychosomatic relationships in both atherosclerosis and coronary thrombosis was urgently required.

#### Suggested lines of research

The main conclusion of the report is that the control and prevention of ischaemic heart

disease can be brought about only as a result of improved knowledge of the relation of environmental factors and ways of life to the pathogenesis of the disease and to the consequent morbidity and mortality. The investigation of the relation to coagulation and thrombosis of such suspected factors as genetic and environmental influences sex specific inborn metabolic disorders arterial hypertension diet (with particular reference to dietary fats) level of physical activity stress strain and mental tension deserves special emphasis in research work.

Lines of research are suggested including in an annex a detailed description of the type of epidemiological study most likely to provide useful results. A second annex on the public health aspects of the disease deals with such matters as case finding screening diagnostic social laboratory and nutrition services and rehabilitation.

The need to standardize both clinical and pathological criteria and terminology in respect of ischaemic heart disease atherosclerosis and related conditions is regarded as sufficiently urgent to warrant the recommendation that WHO should organize a study group to undertake this task. It is also recommended that WHO should continue to expand the collection and regular publication of mortality statistics on cardiovascular and related diseases and should consider giving assistance to national statistical services in developing the analysis of mortality by occupation and social class. Attention is also drawn to the need for improvement in the collection and recording of mortality data and for greater standardization of terms and procedures. Simple field studies on the basis of death certification in different countries might, it is thought quite quickly reveal the possibilities and limitations of the international comparisons now so commonly made. Greater use of insurance company data on heart disease is advocated as an additional means of assessing the importance of the problem.



## ACCIDENTS IN CHILDHOOD

The proverbial phrase accidents will happen only too often reveals a widespread and fatalistic belief that little can be done to prevent them. However with a better knowledge of why and how accidents occur more effective preventive measures could certainly be taken. One particular problem—accidents in childhood—is giving increasing cause for concern among public health workers. The situation is particularly serious in Europe where accidents to children over the age of one year outrank any other cause of mortality. This was one of the reasons which led the WHO Regional Office for Europe to convene a meeting of an Advisory Group on the Prevention of Accidents in Childhood. The members came from eight European countries and the bulk of the material discussed concerned countries in the Region.

The gravity of the present situation is well illustrated by the following remarks taken from the introduction to the Group's report<sup>1</sup> which has recently been published. In some countries [accidents] have become the chief cause of death in childhood and adolescence. Among certain groups of children greater numbers are killed by accidents than by all other causes combined. This unenviable prominence of accidents in child mortality throughout Europe is due too to the new and dangerous hazards introduced into many homes and countries by modern technological progress. The spread of electrification especially in rural areas the introduction of highly potent insecticides the increasing numbers of motor cars and bicycles on roads designed for thirteenth to fifteenth century traffic may be cited as examples.

It is not only as a cause of death that accidents in childhood are important. The number of non fatal accidents is very much larger—between 100 and 200 times greater and by some estimates even more. This

gives some indication of the suffering and loss and sometimes permanent disablement or disfigurement that is involved."

The large majority of accidents in childhood are without the slightest doubt preventable and it was with the object of exploring the possibilities for development of preventive measures that the Advisory Group pursued its discussions.

### Epidemiology of accidents

As the first part of its work the Advisory Group devoted its attention to the epidemiology of accidents. Under this general heading discussion first centred on the international grouping of accidents. The mortality and morbidity statistics established in accordance with the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death* gave it was felt a general idea of the frequency and importance of various causes of accidents and the 781 headings in the Classification made it possible to collect an appreciable amount of information on type and mode of accidents.

In discussing the value of the epidemiological approach the report makes the point that such a method offers a scientific basis for the study of accidents and accident prevention. In each case an explanation of causes can be sought through the interactions of the host—the child at risk the agent—the effective cause of the event and the environment—the chain of external circumstances culminating in the event.

The use of the epidemiological method in the study and control of accidents is well illustrated by an example from Norway. In this country for some years past drowning accidents particularly those of children drowned in wells attracted much public interest. As these deaths were thought to be largely preventable a special study was initiated. An examination of wells throughout the country showed that they were often

<sup>1</sup> *Wld Hlth O s t hn R p S* 1957 118 40 p ges. *Pr ce*  
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insufficiently covered or fenced. Disused wells were a particular hazard. A country wide educational programme was started and state and voluntary health agencies and other bodies were mobilized and the support of the press and radio enlisted. Although the original mortality figures were not large there was a marked reduction in the number of children drowned in wells in Norway in 1955 compared with preceding years. Legislation for compulsory protection of wells was proposed and is at present under consideration.

#### Accident mortality and morbidity

The information contained in the report on the magnitude of the childhood accident problem as a whole gives much food for thought. Data which were presented to the Advisory Group showed that in several European countries although the actual death rates from accidental injury in childhood decreased with age the relative importance of accidents in the total mortality picture increased. Accidents were the leading cause of death in the age group of 1-19 years where they were responsible for 30-40% of all deaths. These data demonstrated quite clearly that for the European region accident prevention should have a high priority among public health efforts.

In a working paper on children's deaths from accidents throughout the world it was indicated that accidents constitute an important problem also for countries outside Europe. In the United States of America and Canada about one-quarter of all the deaths that occur annually among pre-school children and one third of the deaths among children going to elementary school result from mishaps of one kind or another. Accidents killed more than twice as many pre-school children as measles, scarlet fever, whooping cough, diphtheria, dysentery, tuberculosis and poliomyelitis combined. Nevertheless death rates reveal only a small fraction of the child accident problem. As the report stresses, before one can even comprehend the immense task of accident prevention in childhood account must be

taken of all the relatively trivial injuries such as bruises, cuts, minor burns and non-fatal poisonings adding to this the countless times when children narrowly escape disaster. A measure of the frequency of accidents to children was obtained from a British survey of 1000 children born in the Newcastle area in 1947. According to the records 61 children in this group suffered a total of 66 accidents in their first year of life.<sup>2</sup>

In the USA a survey of morbidity conducted in California revealed that the accident rate for children from birth to four years of age was 1199 per 1000 per annum and for children between 5 and 14 years 954 per 1000 per annum as compared with a rate for all ages of 772.<sup>3</sup>

#### Need for detailed information

If childhood accident mortality is to be lessened it is of the utmost importance that more information with regard to the type of accidents should become available. Work is now being carried out in some countries to improve the reporting of fatalities due to traffic and other accidents and the report gives illustrations from France, Belgium and England. In France for example it has been possible with police co-operation to obtain more rapid and complete reporting of road accident deaths. Prior to the present arrangement statistics on road fatalities based on physicians' death certificates indicated about 4000 deaths annually. However when based on police reports the figure proved to be approximately 8000 deaths annually and this is clearly more representative of the actual situation.

In assessing information on mortality the report underlines the importance of grouping factual information on accidents by age, sex and cause. An indication of the value of such grouping is revealed in an analysis by sex which shows that aggregate accident mortality rates in the European region for boys are double or triple those for

<sup>2</sup> Spencer J. L. (1954) *A household family in New Zealand*.  
<sup>3</sup> *San Francisco Field Foundation*.  
<sup>4</sup> California State Department of Public Health (1955) *Home Safety Project annual report*. Berkeley, Calif.

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question was not called for at the present stage. However in a brief review of the general principles the Group stresses the three cardinal points in accident prevention—namely education, engineering, regulation and law enforcement. It was generally agreed

that the keynote of prevention was education in the widest sense of the word. It was an essential part of this education both at home and in school that the child should be made aware of the accident hazards of everyday life and of the means to avoid them.

## PAEDIATRIC EDUCATION

In view of the major role of child care in general medical practice—and this amounts to one third or more of total medical practice in certain countries—the special characteristics of childhood and the content of a minimum paediatric educational programme a WHO Study Group on Paediatric Education deemed it essential that paediatrics should take its place as one of the major subjects of the medical curriculum.

The report of the Study Group which has just been published<sup>1</sup> stresses that childhood is a time of life when the promotion of health can be carried out effectively by the physician as he supervises the child's progress. So that this duty can be accomplished with the greatest benefit a physician requires to have a specific knowledge of the subject as well as special skills.

The Study Group advanced several reasons for assigning a special status to paediatrics in medical education. They included

(a) high morbidity and mortality during early infancy. In large areas of the world sickness and death among infants and children constitute a major public health problem.

(b) paediatrics is not a speciality limited to a technique or to a disease or group of diseases. It is generally applied to a specific period of life.

(c) a child nevertheless is not a miniature adult. Problems and diseases occur in this age group which do not exist in adult life.

(d) the seeds of many diseases seen in adults such as rheumatic fever, tuberculosis and neurosis are sown in childhood.

The importance of extra-mural training was also emphasized in the report. Home visits and collaboration with public health nurses and social workers amplified the student's knowledge of disease and its concurrent problems outside the hospital.

The Group expressed the opinion that all paediatricians should take an active part in communal health work, fostering research and assessing and improving conditions in the community. For this reason it was considered essential for qualified paediatricians to devote at least three months to working in a health department or other social agency providing services for children.

Finally the Group made certain suggestions concerning the role of international agencies in the advancement of paediatric education.

## CONTROL OF BILHARZIASIS

The operation of an ever increasing number of irrigation schemes in various parts of the world and the use of inexpensive and effective molluscicides have increased the need to find practical measures to control bilharziasis. Destruction of the intermediate

host would appear to be a logical line of approach but it has become apparent, in part indeed from the limited success of snail control that comparatively little is known about the relationship between the ecology of the snails and the mechanism of infection.

<sup>1</sup> WHO Bull. 1957 119: 20 p. Price 15/ 30/30 or 5/ 1.—Published in English, French & Spanish.

girls at most ages. The least difference is observed in the younger age groups.

After consideration of the availability and scope of data on accident mortality the Advisory Group thought it of importance to emphasize the following points:

1. Deaths resulting from accidents are gaining in importance among children today because deaths from other causes have been reduced.

2. Accident mortality depends on the peculiarities of the situation in which the population is living. It is noted that in some countries although the number of motor vehicles in use is rising the accident rate is not increasing in like proportion.

3. The main groups of fatal accidents in children are those caused by (a) motor vehicles (b) drowning and (c) fire and burns. The proportion varies from one country to another.

4. There is a limit to the uses to which mortality figures can be put at the international level. Much more can be obtained from such data at the local level through studies involving more efficient classification and intensive study of limited material.

With regard to the supply of information on morbidity the report states that statistics are not generally available with the exception of road accident statistics in some countries. If therefore good mortality figures are available the question remains whether there is a need for morbidity studies. The Advisory Group thought that such studies were justified for the following reasons: (1) they could be designed to give more detailed circumstantial information of value for programme development on such matters as the place and circumstances pertaining to accidents; (2) they might expose an accident problem of unexpected proportions; and (3) morbidity statistics were particularly helpful in respect of the school age groups where mortality rates were low.

#### Statistical studies

Consideration of statistical studies designed to serve as a basis for preventive work and

its later evaluation and the need for greater uniformity and thoroughness in recording information led the Advisory Group to suggest for those countries who might wish to use it a simple accident reporting schedule. The report also draws attention to a number of sources of statistical data such as mortality records, records of accidents treated in hospitals and dispensaries, general practitioners' records, school health statistics, social or private insurance records, preventive child health service records, special morbidity studies including longitudinal surveys, records of police and other services concerned with particular types of accident, and records of special organizations concerned with accident problems. It was felt by the Group that these sources might be drawn upon for accident reporting in the future.

#### Causes, consequences and prevention

The last part of the report is devoted to the circumstances, causes and consequences of accidents and to a short review of the general principles of accident prevention. Attention is given to some of the social, physical, environmental and psychological reasons for accidents among children. Particularly stressed are such factors as the increasing use of electricity in the home with the consequent multiplication of electric points and fixtures, the risks of poisoning by reason of the large amounts of medicaments in the home and the practice of self-medication, and the increasing use of petrol for heating and cooking. It is pointed out that it would be impossible to determine the whole range of social consequences of an accident to a child or even its ultimate cost to the community. As an illustration of this point mention is made of a survey carried out in an orthopaedic hospital and covering 457 cases of burning accidents among children. The total hospital stay for the whole group exceeded 90 000 days and the entire cost came to over half a million dollars.

As to the various possible methods of preventing childhood accidents the Advisory Group felt that a detailed examination of this

question was not called for at the present stage. However in a brief review of the general principles the Group stresses the three cardinal points in accident prevention—namely education, engineering regulation and law enforcement. It was generally agreed

that the keynote of prevention was education in the widest sense of the word. It was an essential part of this education both at home and in school that the child should be made aware of the accident hazards of every day life and of the means to avoid them.

## PAEDIATRIC EDUCATION

In view of the major role of child care in general medical practice—and this amounts to one third or more of total medical practice in certain countries—the special characteristics of childhood and the content of a minimum paediatric educational programme, a WHO Study Group on Paediatric Education deemed it essential that paediatrics should take its place as one of the major subjects of the medical curriculum.

The report of the Study Group, which has just been published<sup>1</sup> stresses that childhood is a time of life when the promotion of health can be carried out effectively by the physician as he supervises the child's progress. So that this duty can be accomplished with the greatest benefit, a physician requires to have a specific knowledge of the subject as well as special skills.

The Study Group advanced several reasons for assigning a special status to paediatrics in medical education. They included

(a) high morbidity and mortality during early infancy. In large areas of the world sickness and death among infants and children constitute a major public health problem.

(b) paediatrics is not a speciality limited to a technique or to a disease or group of diseases. It is generally applied to a specific period of life.

(c) a child nevertheless is not a miniature adult. Problems and diseases occur in this age group which do not exist in adult life.

(d) the seeds of many diseases seen in adults such as rheumatic fever, tuberculosis and neurosis are sown in childhood.

The importance of extra mural training was also emphasized in the report. Home visits and collaboration with public health nurses and social workers amplified the student's knowledge of disease and its concurrent problems outside the hospital.

The Group expressed the opinion that all paediatricians should take an active part in communal health work, fostering research and assessing and improving conditions in the community. For this reason it was considered essential for qualified paediatricians to devote at least three months to working in a health department or other social agency providing services for children.

Finally the Group made certain suggestions concerning the role of international agencies in the advancement of paediatric education.

## CONTROL OF BILHARZIASIS

The operation of an ever increasing number of irrigation schemes in various parts of the world and the use of inexpensive and effective molluscicides have increased the need to find practical measures to control bilharziasis. Destruction of the intermediate

host would appear to be a logical line of approach but it has become apparent in part indeed from the limited success of snail control that comparatively little is known about the relationship between the ecology of the snails and the mechanism of infection.

<sup>1</sup> WHO Hlth Org. *Ar R p Ser* 1957 119 20 p. Price 1s 80 30 or Sw f — Published in English, French, and Spanish.

girls at most ages. The least difference is observed in the younger age groups.

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whereas *Bulinus truncatus* is seriously in commoded before the value of 4000 parts per million is reached. In addition to salts used as molluscicides certain mineral salts such as barium, nickel and zinc are toxic to the snails.

### Biological factors

Although it seems doubtful that natural events and predators could ever be used as effective means of control, they may be of help in reducing snail populations. Among the animals which have been recognized as possibly being of value in the control of snails which transmit bilharziasis may be mentioned water rats, certain species of ducks, turtles (some species feed almost exclusively on snails in nature), salamanders, clawed toads, certain species of fish (e.g. *Gambusia* spp.), many species of aquatic insects, crustaceans (e.g. fresh water crabs of the Potamidae family), carnivorous leeches of various species, and certain ciliates and other snails.

Although there is no doubt that snails are affected by epidemic diseases of viral and bacterial origin, remarkably little information on the parasites and diseases of snails is available and further research should be undertaken.

The feeding habits of various species of intermediate hosts may be important in determining the form in which stomach poisons can be applied. It has been observed for instance that *Tropidocoris centrimegalis* tends to feed on the river bed while *Oncomelania* spp. feed on moist soil above the water level and on micro-organisms found on living and dead vegetation.

### Control measures

Although much remains to be learnt about the complex relationships existing between molluscicides, the snails and the environment, the following details were considered by the Group to be useful in snail control.

1. Information concerning the characteristics of the snail life-cycles indicates that

(a) it may be most favourable to treat after reflooding of a dried habitat since reproduction of pulmonate vectors is generally rapid at that time, the population is small and the snails may be immature.

(b) the great reproductive potential of the pulmonate vectors means that treatments may have to be very frequent and that repeated checks at close intervals may have to be made to ensure effective control.

(c) not all current molluscicides kill the eggs at usual concentrations and repetition of treatment may therefore be necessary.

(d) since *Oncomelania* is more susceptible to molluscicides when it is in its young aquatic phase, treatment should be made when reproduction is active.

### 2. Information concerning snail habits and characteristics indicates that:

(a) in the case of snails resistant to drying, treatment at other than maximum water level may miss some snails and stream clearance should not precede treatment since it removes snails from exposure but may not kill them.

(b) in the case of snails not resistant to drying, the water level at the time of treatment is not so important and the application may be made before the water has reached its maximum level with a consequent saving of chemical.

(c) burial of snails in soft mud may protect them against some chemical agents.

(d) snails may avoid the action of molluscicide by emerging from the water or penetrating into the mud, and the ecological conditions under which such escape reactions may take place need to be further studied.

### 3. Information concerning conditions of habitats indicates that:

(a) substances in the water may affect the action of the chemical. For example, organic matter binds copper and silt interferes with the molluscicidal action of both copper and sodium pentachlorophenate.



The WHO Study Group on the Ecology of Intermediate Snail Hosts of Bilharziasis met in order to consider available data which could lead to practical suggestions on control measures and to make scientists and public health workers aware of the problems involved. The report of the Group has just been published<sup>1</sup>

### Physical factors

All snails which transmit bilharziasis show a high degree of tolerance to variation in the temperature of their habitat. They are able to withstand for a considerable time temperatures ranging from a little above freezing point to well above 37°C.

The effect of annual range of temperature on the length of the breeding season is of importance. In certain areas the period of time during which the water is warm enough to permit oviposition development and growth is only sufficient for the production of one generation. In latitudes where the warm season is longer several generations may be produced or breeding may even continue all the year round. Thus *Bulinus truncatus* in northern Iraq produces only a single generation annually while in central and southern Iraq and in Egypt it produces two or more generations each year. *Australorbis glabratus* in north east Brazil continue to breed all the year round. A similar situation exists with regard to those species of *Oncomelania* which produce only one generation annually in the northern part of their range but breed all the year round in the warm southern areas.

In the past it was thought that snail hosts of bilharziasis were unable to live in complete darkness. However recently *Bulinus truncatus* and *Australorbis glabratus* were bred and maintained in the laboratory in complete darkness over a period of at least five months. Also field observations in Egypt, Rhodesia and South Africa have revealed breeding colonies in covered aqueducts or reservoirs in almost total darkness.

Light may have an indispensable stimulating action on the sex glands of the snails. If this theory were proved to be true covering the irrigation channels or piping the irrigation water could be considered as a practical measure of control.

Water movement in a habitat is beneficial to the snails because it promotes oxygenation of the medium. However violent waves are generally deleterious to intermediate hosts of bilharziasis as is fast running water which appears to prevent the establishment of breeding colonies especially if the water is heavily laden with silt or other suspended particles.

The life cycle of the intermediate snail hosts is greatly affected by seasonal and climatic conditions. Floods appear to be uniformly harmful to snail populations because they have all the deleterious effects of rapid current velocity with the addition in some cases of a marked drop in temperature which is sufficient to interrupt breeding. On the other hand flooding due to rainfall may disperse the snails and lead to their establishment in habitats where they did not previously occur.

It has been shown by experiments carried out both in nature and in the laboratory that certain strains of snails resist desiccation for long periods. Survival out of water for periods ranging from three to eleven months has frequently been observed. It is for this reason that desiccation as a method of control can only be effective under certain conditions.

### Chemical factors

Chemical factors also greatly influence snail populations. The mineral content of the water for example has a profound effect on the snails. The total amount of dissolved solids in the water is of less importance than the proportion of constituent salts. Considerable differences in tolerance exist between the different species. Thus *Australorbis glabratus* is not inhibited by the sodium chloride content of the water until the concentration reaches 6000 parts per million.

followed by a series of one-day conferences held in four local centres which were attended by the presidents and councillors of the communities included in the scheme schoolteachers and others. These conferences were devoted to arousing public interest and co-operation in the work.

Reporting on the progress made with the water supplies one of the WHO consultants stated that although most of the village schemes consisted simply of a mountain spring an aqueduct a reservoir and a distribution system serving a number of points in the village streets with no treatment of the water they had been carefully prepared on sound engineering lines. It was felt that if these water systems were well constructed and properly used they would ensure safe and in most cases reasonably adequate water supplies to the villages. Substantial progress has been made in most of the 18 villages. Work already completed includes the construction of spring structures reservoirs and water points the excavation of pipe trenches and in some cases pipe laying. Other aspects of the project such as excreta disposal latrine construction and health education are also receiving attention.

It is anticipated that the present programme of work will be substantially completed by July of this year but if necessary work will continue beyond that date.

#### Directory of dental schools

The Director General of WHO has recently sent a letter to all Member States informing them that the Organization is now collecting information on dental education from all countries with the aim of publishing a *Directory of Dental Schools*. So that WHO can have at its disposal accurate and complete information the Director General asks that full details of dental education including a list of faculties schools or colleges of dentistry should be furnished by the respective countries. Attached to the letter is a guide outline which lists a number of questions on dental education which WHO is interested in having answered.

#### Malaria advisory teams

A recent innovation in WHO's programme of assistance to governments in the eradication of malaria is the establishment of WHO malaria advisory teams for survey work in the field. At present three teams are operating two of them providing expert advice on national antimalaria programmes and the third to which reference is made on page 133 of this issue concentrating its activities entirely on a study of the *Anopheles gambiae* problem in Africa. The latter team which is known as the *A. gambiae* Research and Advisory Team has a different organization and a more limited field than the two general advisory teams.

The advisory teams visit countries at government request and through their field work study at first hand the progress being made. The main objectives are to give guidance to governments on the possible conversion of existing antimalaria programmes to eradication programmes or if eradication work is already in progress to give expert advice on how it can best be conducted in the future. Each advisory team consists of a malariologist acting as team leader an entomologist and two laboratory technicians. The team is self sufficient as regards transport laboratory equipment and supplies. These advisory teams spend practically all their time in the field where they make spot surveys (malariae metric epidemiological and entomological) and investigate any special problems. They also make a careful study of data already available. Before any actual recommendations are made a leading consultant malariologist is sent by WHO to the team's headquarters in order to discuss the findings with the team leader and the entomologist correlate these with existing local data, and on that basis give pertinent advice to governments.

The advisory teams have already completed two assignments. The first, in Iran lasted for four months and was completed in November 1956. The eradication phase has been reached in Iran and the team's attention was mainly focused on surveillance. In addition a special study was made of ano

(b) vegetation and irregular margins may impede the distribution of soluble chemicals

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Observations on the establishment of breeding colonies of bulinid and planorbis snails in irrigation systems in various parts

of the world have led to the development of some engineering control measures which may be expected to limit or reduce snail populations. Among these may be mentioned clearance of weeds covering of channels or piping of irrigation water and drainage and lining of irrigation canals.

The development of ecological research has now reached a point at which extensive field studies can no longer be efficiently carried out by individuals and co-operation between specialists in different scientific disciplines is desirable.

## *Notes and News*

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### **Rural sanitation in northern Greece**

In many areas of the world improved sanitation is a prerequisite if the public health programmes which have been planned are to prove successful. WHO's work on environmental sanitation is largely concentrated on the improvement of rural sanitation (training of sanitation personnel, the development of administrative organizations and the dissemination of information). With regard to the development of rural sanitation an important project under execution in 18 Greek villages situated in eastern Macedonia affords a good example of the way in which the Organization assists a country in a sanitation programme.

The agreement signed in 1955 between the Greek Government, WHO and UNICEF for sanitation work in these 18 villages had the following principal aims:

(1) To provide safe and adequate water supplies to the populations concerned especially to centres serving children such as schools and children's homes.

(2) To provide satisfactory and hygienic means of disposal of excreta and other wastes.

(3) To undertake a campaign of health education to ensure proper use of the facilities provided and to encourage self-help.

(4) To train the technical workers concerned in the programme by special courses and by fellowships.

The responsibilities of WHO in this plan were to give technical advice on the execution of the projects as required to provide consultants to help with the courses of instruction and to award fellowships for study abroad. UNICEF agreed to supply the pipes and fittings required for the water supplies (the total length of pipes being about 24 miles) while the Greek Government undertook to supply the necessary personnel to provide transport and other materials such as cement and steel and to meet the other expenses of the programme.

Work on the project started in the summer of 1955 and the UNICEF supplies began to arrive in Greece in February 1956. In April and May 1956 two consultants were sent by WHO to Greece to assess the conditions in the villages to report on the progress of the scheme and on the delivery and distribution of the UNICEF supplies and to organize in Salonika a course of training for the various workers engaged. This was an intensive course of one week's duration which had a total attendance of 136 including doctors, engineers, sanitary inspectors, veterinarians, midwives, health visitors and the directors of the children's homes and maternal and child health centres. It was

followed by a series of one-day conferences held in four local centres which were attended by the presidents and councillors of the communities included in the scheme schoolteachers and others. These conferences were devoted to arousing public interest and co-operation in the work.

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## Sanitary airports

A recently published Supplement to the WHO *Weekly Epidemiological Record* (No 10 Suppl 7) contains up-to-date information on sanitary airports and on airports with direct transit facilities in a large number of countries and territories throughout the world. The International Sanitary Regulations define sanitary airports as those which have *inter alia* an organized medical service with adequate staff equipment and premises. Airports with direct transit facilities are those with special accommodation for the segregation and medical supervision of passengers and air-crews breaking their journey without leaving the airport.

Also published in the Supplement are the names of airports in Ceylon, Mexico and the Union of South Africa designated for the landing of aircraft coming from yellow fever infected areas.

## Drug addiction and drug habituation

The need for a clear distinction between drug addiction and drug habituation was a question given detailed consideration in the recently published seventh report of the WHO Expert Committee on Addiction Producing Drugs. The Committee was of the opinion that the two expressions *addiction producing* and *habit forming* were still too commonly used interchangeably. In reviewing the definitions and clarifications of addiction producing and habit forming drugs already published in the Committee's second and third reports it was felt that the time was opportune to emphasize once again the distinction between addiction and habituation and the necessity of strict application of the terms *addiction producing* and *habit forming* that "there may be appropriate warning in both instances on labels and in all literature so that the occurrence of abuse may be watched for and guarded against." The Expert Committee therefore adopted the following definitions that for drug addiction

being substantially the same as the one given in the second report of the Committee and that for drug habituation being new

### *Drug addiction*

"Drug addiction is a state of periodic or chronic intoxication produced by the repeated consumption of a drug (natural or synthetic). Its characteristics include (1) an overpowering desire or need (compulsion) to continue taking the drug and to obtain it by any means (2) a tendency to increase the dose (3) a psychic (psychological) and generally a physical dependence on the effects of the drug (4) detrimental effect on the individual and on society

### *Drug habituation*

Drug habituation (habit) is a condition resulting from the repeated consumption of a drug. Its characteristics include (1) a desire (but not a compulsion) to continue taking the drug for the sense of improved well being which it engenders (2) little or no tendency to increase the dose (3) some degree of psychic dependence on the effect of the drug but absence of physical dependence and hence of an abstinence syndrome (4) detrimental effects if any primarily on the individual

## UN Advisory Committee at WHO Headquarters

In response to an invitation from the Director General of WHO the United Nations Advisory Committee on Administrative and Budgetary Questions paid a visit to WHO Headquarters between 25 March and 5 April for the purpose of holding consultations with WHO officials on administrative and budgetary co-ordination between the United Nations, WHO and the other Specialized Agencies.

The Advisory Committee which is one of the standing committees of the UN General Assembly consists of nine experts appointed in their individual capacities by the General Assembly. The Chairman of the Committee, Ambassador T. Aghnides of Greece, has held this position since 1946.

phes resistance to insecticide Resistance to DDT was confirmed in one species and evidence of it found in another

The second completed mission was in Afghanistan where an advisory team made a three month stay at the end of 1956 As there was a planned change from control programmes to eradication in Afghanistan the principal work for the advisory team was to determine those areas in which spraying operations could be brought to an end

Both advisory teams have now taken up new assignments The first team is at present in Taiwan where it is now completing its work before going on to the Philippines early in June for a further four month mission The second team has been at work in Ceylon for the past four months Eradication in that country is well advanced and the question of surveillance is now uppermost

### USSR resumes active participation in WHO

The Government of the Union of Soviet Socialist Republics has informed Dr M G Candau Director General of WHO of its decision to resume active membership in WHO this year The USSR became a Member State in March 1948 but discontinued active participation in February 1949 Albania Bulgaria and Poland have already announced their resumption of active participation in WHO<sup>1</sup>

### Malaria control in Taiwan

The report of the Malaria Conference for the Western Pacific and South East Asia Regions held in Baguio Philippines in November 1954 (issued in the *World Health Organization Technical Report Series* No 103) gave details of the labour employed on malaria control programmes in various Asian countries It has been pointed out that under the heading China (Taiwan) in the table reproduced on page 23 of the report the 159 foremen or squad leaders the 636 skilled labourers and spraymen and the 308 un

skilled labourers were actually employed for a period of only 60 75 days

### Expert Committee on Food Additives

The increase in the number of chemicals used or proposed for use in foods in recent years has imposed on public health authorities and other governmental agencies the heavy responsibility of deciding whether or not these substances should in fact be employed The Joint FAO/WHO Expert Committee on Food Additives which held its first meeting in Rome in December 1956 considered that safety for use must be the most important consideration in making such decisions This group stated that while it is impossible to establish absolute proof of the non toxicity of a specified use of an additive for all human beings under all conditions critically designed animal tests of the physiological pharmacological and biochemical behaviour of a proposed additive can provide a reasonable basis for evaluating the safety for use at a specified level of intake

In view of this the Committee recommended that a further session should be held to discuss procedures for the toxicological testing of food additives FAO and WHO have given effect to this recommendation by calling a second meeting of the Joint Expert Committee to be held in Geneva from 17 to 24 June 1957 This group will discuss procedures for the determination of acute and sub acute toxicity chronic toxicity and possible carcinogenic effects The place of metabolic and biochemical investigations in determining safety for use will also be considered as well as the interpretation of the toxicological data in terms of man and the safety factors which should be employed

The following experts have been invited to attend Professor E Abramson (Sweden) Mr M G Allmark (Canada) Dr J M Barnes (United Kingdom) Dr R Blackwell Smith jr (United States of America) Dr F A Denz (New Zealand) Professor A C Frazer (United Kingdom) Dr H van Genderen (Netherlands) Dr B Mukerji (India) Dr Howard Spencer (United States of America) Professor R Truhaut (France)

problem the definitive solution—eradication of the disease—has been given first priority in the public health work of the Pan American Sanitary Bureau (PASB) which acts as WHO Regional Office for the Americas. As the co-ordinator of international health work in the Americas the PASB has established technical standards essential for malaria eradication and is helping national health services to make these standards known, accepted and applied in the eradication programmes of the various countries.

Since the beginning of the year approximately one million houses have been sprayed in the malarious areas of the Region out of an estimated total of five million which must be reached before continental eradication of malaria can be achieved. However with the possibility of the development in vectors of resistance to the residual insecticides it is of first importance that eradication should be completed as soon as possible. Therefore the need for the early establishment of full scale national eradication programmes in addition to those already initiated is pressing. Standard eradication procedures are now being developed by the various national health services as rapidly as the availability of funds and of technically trained personnel permit.

The funds available to the Pan American Sanitary Organization for malaria eradication have recently been increased by a contribution of \$100 000 from the Dominican Republic—the first instalment of a pledged donation of \$500 000. The Government of the United States of America has already made a contribution of \$1 500 000.

#### Technical conference on insect resistance

The principal technical impediment to success in the control or eradication of vector borne disease is insecticide resistance. It is a problem which in the view of the WHO Expert Committee on Insecticides has been growing much more rapidly than measures to deal with it. This fact led the Expert Committee at its seventh meeting to recommend that WHO should assume leadership in the stimulation and co-ordi-

nation of an international research programme on the resistance problem.

In line with this recommendation WHO has convened a Technical Conference on Insect Resistance which will be held in Geneva between 25 and 31 July 1957. The meeting which will be attended by directors of laboratories will devote its attention primarily to discussions on the implementation of a programme for the co-ordination and stimulation of research on insect resistance. It will also consider what lines of research are necessary to formulate counter measures against resistance, suggest ways and means of bringing about a greater concentration of effort on the problem and study future needs in technical personnel and equipment. The following will participate in the conference: Dr A. L. Berti (Venezuela), Dr D. Dresden (Netherlands), Dr R. A. E. Galley (United Kingdom), Dr J. Hamon (France), Dr H. Laven (Germany, Federal Republic), Dr A. W. Lindquist (United States of America), Professor G. MacDonald (United Kingdom), Dr E. Mosna (Italy), Mr K. D. Quarterman (United States of America), Dr A. A. Sbawarby (Egypt), Lt Col Jaswant Singh (India).

#### Mental health and atomic energy

WHO is convening a study group on the subject of the mental health aspects of the peaceful uses of atomic energy which will meet from 4 to 9 November 1957. The preparatory work for this meeting will be in the hands of Dr Kenneth Soddy of the United Kingdom who has been specially recruited as a consultant for this purpose.

The task of the study group is to determine whether the increased use of atomic energy for peaceful purposes has brought in its train any mental health problems and if so to investigate the nature and extent of these problems and to suggest scientific ways and means of dealing with them.

Interesting material for study has been brought to light by preliminary investigations already made. Scientists generally agree that the present danger to human



During the course of the session—the first to be devoted exclusively to WHO affairs at the Geneva headquarters—the Advisory Committee paid particular attention to the administrative workings of the technical assistance programme and its relation to the total programme of WHO. In general the Committee's work was aimed at ensuring that administrative operations of the United Nations and the Specialized Agencies were carried out in the most efficient and economical manner possible and that co-ordination and uniformity were secured wherever feasible.

### Supply of rabies reference vaccine

Because of the loss in potency which may occur in rabies vaccines produced, stored and used under different climatic conditions and circumstances, it is essential to perform stability tests in order to determine the duration of antigenicity. In the USA the National Institutes of Health supply ampoules of a Reference Vaccine (155D) to laboratories which produce rabies vaccine so that they may perform potency tests which have a comparable basis. It was recognized at the third session of the WHO Expert Committee on Rabies which met in December 1956 in Paris that it would be desirable for national laboratories to prepare their own stock of a reference vaccine which after comparison with the Reference Vaccine 155D could be used to supply routine production laboratories within a country. However, since Reference Vaccine 155D is an ultraviolet light inactivated dried product, its production can only be undertaken at the present time in relatively few countries. WHO maintains at the Department of Biological Standardization, Statens Seruminstitut, Copenhagen, a small stock of Reference Vaccine 155D kindly made available by the National Institutes of Health and will supply upon request ampoules to national laboratories wishing to prepare their own Reference Vaccine or so far as its stocks permit reasonable quantities of the Reference Vaccine for the performance of routine potency tests on large batches of vaccine. Requests

should be made directly to the Statens Seruminstitut in Copenhagen. The use of Reference Vaccine 155D for these purposes is described in the WHO monograph *Laboratory Techniques in Rabies* (Wld Hlth Org Monogr Ser No 23).

### Survey tour by French author

Pierre Gascar, the well known French writer whose work *Le Temps des morts* was awarded the *Prix Goncourt* in 1953, recently concluded a reconnaissance tour through countries of Asia, Africa and the Pacific region.

His four month journey—made by air, jeep, on muleback and on foot—took him to India, Thailand, the Philippines, Indonesia, Malaya, Ethiopia and Sudan and in each of these countries he shared the day to day life of their health teams which are engaged in fighting such major human scourges as malaria, leprosy, yaws and tuberculosis.

Mr Gascar has thus had a unique chance to observe and gather material on various phases of the world wide operations that have taken shape in the under developed areas of the world since the inception of the World Health Organization, each designed to the same end—the betterment of man's health and well being. He has seen at first hand the tremendous efforts being made by governments with WHO's help to overcome the pressing health problems that must first be brought to manageable proportions before progress in other directions can attain fuller measure.

The material collected by Mr Gascar is to be incorporated in a book which will probably be published commercially in 1958 to coincide with the tenth anniversary of WHO.

### Malaria eradication in the Americas

It has been estimated that there are some eight million cases of malaria yearly in the Americas. Because of the gravity of this

problem the definitive solution—eradication of the disease—has been given first priority in the public health work of the Pan American Sanitary Bureau (PASB) which acts as WHO Regional Office for the Americas. As the co-ordinator of international health work in the Americas the PASB has established technical standards essential for malaria eradication and is helping national health services to make these standards known, accepted and applied in the eradication programmes of the various countries.

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The task of the study group is to determine whether the increased use of atomic energy for peaceful purposes has brought in its train any mental health problems and if so to investigate the nature and extent of these problems and to suggest scientific ways and means of dealing with them.

Interesting material for study has been brought to light by preliminary investigations already made. Scientists generally agree that the present danger to human

health and happiness from properly organized atomic energy projects is negligible. Nevertheless apprehension still exists and has been freely ventilated in the press. Of all alleged medical and health hazards that of danger from radiation is the one that has given rise to the greatest anxiety. Indeed plans to establish nuclear energy plants sometimes meet with local opposition.

Official reassurances on this matter may not be entirely effective due partly to the fact that the scientific aspects have not as yet been subjected to investigation. The public is accordingly not disposed to accept assurances based on a denial of the existence of any problem.

The possible cumulative ill effects of radiation applied in medical therapy is another matter of concern. Public controversy has drawn attention to the surprising fact that the anxiety or fear that is often engendered in patients subjected to such treatment due partly to the dread nature of the diseases involved and partly to the impressive character of the apparatus and techniques used has as yet received scant scientific investigation. It is generally recognized that an anxiety state impairs both resistance to disease processes and the capacity to recover yet it has been left to the intuition and goodwill of the radiologist to try to allay the patient's apprehensions and instil in him the will to recover without which medical science may prove unavailing. Problems of this kind will figure among the many questions to be examined by the study group.

Dr Soddy is in charge of child psychiatric work at University College Hospital London. He is also a lecturer in the Medical School and in the Department of Psychology of University College. In addition he holds the post of Medical Director of the Child Guidance Training Centre London where professional training is provided for post graduates. He has had extensive experience of mental health work at the international level in his capacity of Assistant Director of the World Federation for Mental Health a position he has held since the inception of that body in 1948. He is therefore parti-

cularly qualified for preparing the ground for investigation into this hitherto unexplored sphere.

In the next few months Dr Soddy will be assembling information from atomic energy plants hospitals and wherever else atomic energy is in use on the human and social aspects of the problem. Further enlightenment will be sought in scientific writings popular literature and the press to determine how the irrational hopes and fears in regard to atomic energy are being treated. This information will be collated to form a basis for the study group's work.

### *Dangers of tranquilizing agents*

The increasing use made by the public of certain so called "tranquillizing" agents has prompted the WHO Expert Committee on Addiction Producing Drugs to publish a warning on their possible effects. Commenting on the habit forming propensities of these drugs the Committee's seventh report<sup>1</sup> says: "Many authorities have expressed the view that all drugs which are used therapeutically for a central sedative or tranquillizing effect to promote sleep or to relieve anxiety may be habit forming. Some drugs which are used for a central stimulating or exhilarating effect may also be habit forming. With both types the essential factor presumably is improvement in the sense of well being. Habituation with these agents is not primarily or essentially an abuse except that it may lead to unduly prolonged or excessive administration not related to symptomatic relief. Such excessive administration may result in physical dependence and development of a true addiction. With the barbiturates for example Fraser and his associates have established that there is a critical dosage level for some barbiturates above which definite addiction with all of its characteristics is demonstrable. Whether this is so for sedatives generally is not known but the possibility of their producing habituation should be recognized and becomes of greater

and greater importance with the widespread and ever increasing use of the so-called tranquilizing agents"

### International rabies reporting

The present unsatisfactory situation with regard to rabies reporting led the WHO Expert Committee on Rabies to make the following recommendation in its third report:

"The necessity of prompt reporting of rabies within a country for national control purposes has been stressed previously by the Committee. For international purposes it is important that information of the current status of rabies in countries throughout the world be made available. The Committee strongly recommends that such information be supplied to WHO periodically preferably every six months so that this information would be available for Member States.

In the past rabies statistics have often been difficult to interpret because of gaps of information on various aspects of the disease in places where post exposure treatment is given. The Committee recognizes that detailed information forms are often used but these frequently defeat the purpose for which they are intended because of reluctance to fill out all the details requested in such forms. A simplified form is therefore suggested which covers the principal items in connection with suspected rabies exposure in human beings. The Committee recommends the use of this or of a similar form to rabies authorities.

### Death of Dr Raymond Gautier

The news of the death of Dr Raymond Gautier, a former Assistant Director General of WHO in charge of the Department of Central Technical Services, has been received with regret. Dr Gautier had participated in the work of WHO since the establishment of the Interim Commission in 1946. In the course of a long career in international work

which started in the Health Organisation of the League of Nations in 1924, Dr Gautier specialized in the field of biological standardization. Between 1926 and 1930 he occupied the post of Director of the Eastern Office of the League's Health Organisation at Singapore.

On reaching retirement age Dr Gautier left WHO in 1950 and thereafter became Research Director for the International Children's Centre in Paris. A full account of Dr Gautier's career was published in the February 1950 issue of the *Chronicle*.

### Death of Dr Gerard Montus

Dr Gerard Montus, Deputy Director of the WHO Regional Office for Europe, died in Geneva on 21 April 1957 after a long and painful illness. His death will be deeply regretted by all his fellow workers and by his many friends in the field of public health.

Dr Montus was born at Carry le Rouet near Marseilles in 1907 and graduated in medicine at the University of Montpellier. He continued his studies at the Pasteur Institute in Paris and at the University of Paris where he took a degree in public health. For some time he was in charge of the Children's Clinic of the University of Marseilles. Later he was Departmental Director and then Regional Director of Health at Marseilles and Director of Child Health at the Ministry of Health in Paris.

Dr Montus served as a member of several French delegations to the World Health Organization and its Interim Commission. He joined the Organization in 1949, serving first as European Regional Adviser on Maternal and Child Health and later as Chief of the Headquarters Social and Occupational Health Section.

In 1952 he was appointed Deputy Director of the Regional Office for Europe where his energies were principally devoted to programme planning. In 1956, on the death of Dr Bege, Regional Director, Dr Montus took over the direction of the Office until he in turn was overtaken by illness.

## Death of Dr Thorvald Madsen

The death of the distinguished Danish bacteriologist Dr Thorvald Madsen has just been reported from Copenhagen. Dr Madsen who was 87 years of age took his M.D. from Copenhagen University. In 1902 he was appointed Director of the Statens Serum Institut and did not relinquish this post until 1940. Dr Madsen's international experience started in the First World War when he worked for the Red Cross. In the inter-war years he became active in the League of Nations and between 1921 and 1940 was President of the League's Health

Committee and its Commission on Biological Standards. The work of both bodies received world-wide recognition and this success was due in large measure to the untiring efforts of Dr Madsen. The important work initiated by the two committees under his presidency is now being carried on by WHO.

Following the end of the Second World War Dr Madsen served for three years as Head of the UNICEF Mission to Italy. Dr Madsen's death will be deeply regretted by public health workers throughout the world as he was generally acknowledged to have been one of the pioneers of international health work.

## People and Places

### WHO HEADQUARTERS APPOINTMENTS AND DEPARTURES

Dr Willem Aegidius Timmerman of the Netherlands has recently been appointed Assistant Director General in charge of WHO's Central Technical Services. Dr Timmerman took his M.D. at the University of Leiden in 1918 and thereafter pursued a distinguished scientific career in the Far East and in the Netherlands specializing in bacteriology, biological standardization and the control of pharmaceuticals. From 1928 to 1931 Dr Timmerman worked in the Pasteur Institute in Java and later was appointed Director of the State Institute for Public Health in the Netherlands, a post which he held until 1950 when he joined WHO as Director of the Division of Therapeutic Substances.

In his new post Dr Timmerman will be particularly concerned with the work of the Divisions of Epidemiological and Health Statistical Services, Therapeutic Substances and Editorial and Reference Services.

\* \*

M. Jean Brouland formerly Administrative and Finance Officer of the WHO Regional Office for South East Asia has been appointed Chief of Personnel at WHO Headquarters and took up his new duties during May. M. Brouland succeeds Mr John Armstrong who, as already announced in the *Chronicle*, became Director of the Division of Administrative Management and Personnel on 1 April.

The Director General of WHO recently announced the resignation of Dr Marcelino Pascua who has left the Organization to become Director of the Centro Latino Americano de Entrenamiento e Investigaciones en Demografía (Latin American Centre for Training and Research in Demography) in Santiago de Chile. Dr Pascua took up his new duties there on 17 April 1957.

Coming to WHO from the Johns Hopkins University, Baltimore, Md. where he had been Assistant Professor of Biostatistics and Epidemiology, Dr Pascua joined the secretariat of the WHO Interim Commission on 1 February 1948 as a Statistical Expert. Before entering university life in 1939 he had had a distinguished career in national and international health work.

In September 1948 Dr Pascua was appointed Chief of the Health Statistics Section and in 1950 became Director of the Division of Health Statistics. In January 1953 he was made Director Consultant on Health Statistics in order to assist in the development of national health statistical services.

Mr Prescott A. Stevens of the United States has been transferred to the Malaria Section at WHO Headquarters for service as a public health engineer after six years spent in work on the WHO assisted malaria and insect-borne diseases control projects in Iran. His particular duty will be to advise on the administrative and organizational aspects of malaria eradication programmes, a task for which his earlier experience in the field has fitted him well.

Mr Stevens holds the degrees of bachelor of science in civil engineering from the Worcester Polytechnic

1111te Worcester Mass. and master of science in sanitary engineering from Harvard University Prior to joining the WHO staff he was for a year an area hygiene officer with the Italian Field Office of the International Refugee Organization.

## MALARIA FIELD APPOINTMENTS

WHO's extensive work towards the ultimate eradication of malaria goes on apace. The two special advisory teams set up last year (see Notes and News page 167) have already completed two assignments in Iran and Afghanistan and are now at work in Taiwan and Ceylon. The team in Taiwan is headed by Dr M. E. Farnaud, who took over the leadership from Dr J. de Z. Lueta, of the WHO Headquarters staff. Dr Z. Lueta was temporarily assigned to this work in Iran. Mr P. Jobet is the entomologist of the team and Mr K. Thymakis and Mr P. Caplan are the laboratory technicians. The second team, of which Dr S. A. Ery Jones is the leader, reached Ceylon in February of this year. Dr W. W. G. Buttiker is the entomologist and Miss L. Eli Lowy and Mr P. F. Beales the laboratory technicians. Dr A. Ery Jones came to this work from his previous WHO assignment in Liberia.

Taiwan and Ceylon are in the late stages of malaria eradication. The attention of both teams is focused on the work of the surveillance system and the study of the main malaria vector.

Mr J. C. Vedamankam of India, an entomologist, is another new recruit to WHO's work in this domain. He has joined Dr S. R. Y. Chowdhury in the WHO aided project now in operation in Sudan. Mr Vedamankam, a graduate of Madras University, was formerly chief entomologist of the Public Health Service of the Government of Madras. From 1950 to 1952, he served as the government (counterpart) entomologist with the WHO-assisted malaria project in Ernad, South India. Mr M. F. Gohar of Egypt, who has been on the WHO staff since 1952, first with a cholera project in East Pakistan and subsequently with malaria projects in Saudi Arabia and Syria, has recently been transferred to this same project to act as sanitarian.

Professor G. Liadas, of the Athens School of Hygiene, who has once again joined the WHO staff, will now act as malariaologist-consultant for the malaria pilot project now in progress in Yaoundé in the French Cameroons. Professor Livadas has for some time been the WHO Regional Adviser in South East Asia and he has also served the Organization as consultant on the use of insecticides. He was Chairman of the 1956 meeting of the WHO Expert Committee on Malaria. His task in Yaoundé is to

study the position reached in the present operations, which have been going on for some years past, and to advise on the future conduct of the work against malaria in the French Cameroons.

Burma's malaria eradication programme has recently been strengthened by the transfer there of Mr Sankaranarayanan Sundararaman of India. Mr Sundararaman is an entomologist who has been working for the last three and a half years with the WHO-assisted project in Indonesia.

Dr P. C. Issaris of Greece, who has served with WHO since 1949, has arrived in Liberia where he is to advise the Government on the future development of antimalaria work in that country. Dr Issaris has previously acted as leader of the WHO-UNICEF assisted project in Uttar Pradesh, North India, and as senior adviser of the project in Indonesia. On completion of his assignment in Liberia he will be taking over from Dr Farnaud the leadership of the malaria advisory team now in Taiwan which is next scheduled to visit the Philippines.

The staff of the WHO malaria co-ordinated nation office for the Eastern Mediterranean Region, Alexandria, has just been strengthened by the appointment of Mr H. A. Rafi of Iran, who has recently taken up duties as a public health engineer there. Mr Rafi, who is Chief of the Malaria Eradication Division of the Iranian Ministry of Health, has been given leave from his duties for a period of two years to undertake this work. He will be joining forces with Dr M. A. Fand, the WHO Regional Malaria Adviser in developing eradication campaigns in the area.

Mr Rafi, who was educated at the University of Teheran and the Institute of Malariology in Rome, subsequently he studied public health engineering in the United States at the Universities of Minnesota, Ohio State and Emory University, Atlanta, Ga.

## SUDAN TUBERCULOSIS CENTRE

Mr Andrew N. Ruane of Ireland, is the latest member of WHO to join the staff of the Tuberculosis Demonstration and Training Centre at Wadi Medani, Sudan, where he has just taken up a post as laboratory technician. The Centre, which is soon to be opened, has been organized by the Sudanese Ministry of Health with financial assistance from the United Nations Technical Assistance Board and technical help from WHO. Its functions are to investigate the extent of the tuberculosis problem in Wadi Medani and eventually throughout the Blue Nile Province, to develop methods appropriate for controlling the disease there and to train personnel so that the service may be extended to other parts of Sudan.

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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## LEADING LEPROLOGIST APPOINTED

WHO has secured the services of one of the world's acknowledged leading leprologists Dr Robert G Cochrane of the United Kingdom to assist in reviewing the present position in regard to leprosy immunity with particular reference to the possible efficacy of BCG vaccination as a preventive agent.

Dr Cochrane has had long world wide experience in leprosy work. At present he holds the post of Technical Medical Adviser of American Leprosy Missions with headquarters in London and he is also adviser on leprosy to the Ministry of Health. His varied career has included many other consultant posts notably that of adviser to the Government of India. Dr Cochrane is a member of WHO's Expert Advisory Panel on Leprosy. He took a leading part in introducing the use of the drug *diamino diphenyl sulfone* in leprosy therapy—a development which has brought new hope to sufferers all over the world.

## PUBLIC HEALTH ADVISER VISITS PAKISTAN

The Eastern Mediterranean Regional Office of WHO recently despatched its Public Health Adviser Dr Leo Kaprio to Pakistan for the purpose of consulting with the Pakistan Government on future health programmes in that country and of visiting the WHO aided field projects now in operation there. The activities assisted by the Organization cover many aspects of public health work and include notably the Maternal and Child Health Demonstration and Training Centres in Karachi and Dacca, nursing projects in the same two cities, venereal diseases control project in Chittagong, country wide BCG vaccination campaign, the Children's Hospital in Karachi, assistance to medical schools and to the schools of sanitary engineering and physiotherapy of West Pakistan.

## ASSISTANCE TO EDUCATIONAL INSTITUTES

The Institute of Hygiene of the University of the Philippines is to receive assistance in the form of a visiting lecturer in biostatistics under a joint undertaking of WHO, the Johns Hopkins University, Baltimore Md, and the University of the Philippines. The Rockefeller Foundation is also participating.

Dr Matthew Tayback of the United States of America is to be granted leave of absence from his

post of Director of the Statistical Section of the Baltimore City Health Department for this assignment which begins on 1 July 1957 and will last for three months.

## ENVIRONMENTAL SANITATION

Mr Max L Roy of Haiti has recently been assigned to the staff of a WHO team which is now at work in Iraq. Mr Roy is a public health engineer and his duties will be to assist in establishing and developing in Dyala Liwa a model provincial health department integrated with the existing medical services. Administrative and technical procedures are to be tested and proved with a view to their adoption in other provinces of the country. Mr Roy will also be engaged in setting up a practical rural training area for various types of health personnel. Prior to joining the WHO staff in December 1953 Mr Roy had had a lengthy experience in his own country in public health engineering and notably in rural sanitation work. In an earlier assignment with WHO he advised the Ministry of Public Health of Afghanistan on the setting up of a sanitary engineering programme for that country.

## ORGANIZATION OF PUBLIC HEALTH SERVICES

Dr Ernesto J de Oliveira of Portugal has recently been appointed by WHO to serve as a medical officer. He has been assigned to La Réunion and will shortly be arriving there to take up his duties as team leader of the WHO assisted project now operating in the island. This team of WHO public health staff is assisting the governing authorities in response to a request for help in making a general health survey of the island with a view to drawing up an effective programme for improving its health situation.

La Réunion, situated in the Indian Ocean east of Madagascar, is a Department of France with a population of about 260 000.

Dr de Oliveira received his medical training at the University of Oporto and recently took his diploma in tropical medicine and hygiene at the London School of Hygiene and Tropical Medicine. He worked as a public health officer with the United Nations Korean Reconstruction Agency from 1952 to 1955 after having served for five years in his national health services.

## TENTH WORLD HEALTH ASSEMBLY

The Tenth World Health Assembly which was held from 7 to 24 May 1957 in Geneva was attended by the delegates of 79 Member and Associate Member States. The proceedings were followed by representatives of the United Nations and its specialized agencies and of a number of inter governmental and various non governmental organizations in official relations with WHO as well as by observers from several non Member States.

In opening the session Professor J. Pariset, President of the Ninth World Health Assembly, expressed the unanimous satisfaction felt at seeing the delegations of Albania, Bulgaria, Poland and the Union of Soviet Socialist Republics resume their places within the Organization. (The Assembly was informed shortly before its closure that Romania had also decided to resume active participation.) Referring to the tasks which devolve on WHO and in particular to those connected with the introduction of automation and the utilization of new forms of energy, Professor Pariset declared:

The policy followed with success, particularly in the fields of scientific research, professional and technical training and health education, the solid and coordinated regional structure, the fruitful collaboration with other specialized agencies—these are all sure guarantees of WHO's ability effectively to undertake new tasks and promote progress in health within the framework of economic and social advances.

Professor Pariset also paid a last tribute to the memory of Dr Gerard Montus, Deputy Director of the Regional Office for Europe and Professor R. Gautier, a former Assistant Director General of WHO.

The Assembly unanimously elected Dr S. Al Wahbi (Iraq) as President and Dr M. El Materi (Tunisia), Dr D. A. Cameron (Australia) and Dr O. Vargas Mendez (Costa Rica) as Vice Presidents. Dr B. M. Clark (Union of South Africa) was elected Chair-

man of the Committee on Programme and Budget and Mr Akira Saito (Japan) Chairman of the Committee on Administration, Finance and Legal Matters. The Executive Board was represented by its Chairman, Professor G. A. Canaperia, and Mr W. H. Boucher, Chairman of the Board's Standing Committee on Administration and Finance.

In his inaugural address, Dr Al Wahbi, after welcoming the new State of Ghana as a full Member of the Organization, associated himself with Professor Pariset in extending greetings to the delegates of the countries resuming active participation in the work of the Organization. He said:

This Tenth World Health Assembly is all the more enriched by the presence of four countries which we have sadly missed for some years past. A world health organization cannot hope to function at its full power if it is deprived of the participation of a substantial portion of the world's people, and all of us who desire above all to see this organization at its maximum service to the health of the world must wish that very shortly the World Health Organization will possess that universal representation which, in the spirit of its founders, was the rock on which it was built.

On the subject of the efforts made by the Organization to achieve its objectives as laid down in the Constitution and in the programme of work prepared and approved by the Assembly, Dr Al Wahbi stated:

The work in 1956 proves that the World Health Organization has learnt year by year how to profit from its hard won experience and how to usually adapt its policies and programmes to meet the evolving needs of its Member countries. After nine years of work, our Organization may justly claim that it is now equipped to carry out with maximum efficiency any tasks however arduous and however delicate that it may be called upon to perform.

To develop this work has required wise overall direction from the World Health Assembly, ever watchful guidance and untiring scrutiny from the Executive Board and the probity, devotion, and

## SCHEDULE OF MEETINGS

- |                 |   |
|-----------------|---|
| 15 20 July      | Expert Committee on Poliomyelitis Geneva  |
| 25 31 July      | Technical Conference on Insect Resistance Geneva  |
| 26 30 August    | Expert Committee on the Public Health Aspects of Water Fluoridation Geneva  |
| 5 11 September  | WHO Regional Committee for the Western Pacific Region Eighth Session Hong Kong  |
| 9 14 September  | Study Group on Schizophrenia Geneva   |
| 10-13 September | WHO Regional Committee for Europe Seventh Session Copenhagen  |
| 16-21 September | Expert Committee on Biological Standardization Geneva   |
| 16-21 September | WHO Regional Committee for Africa Seventh Session Brazzaville   |
| 16-21 September | WHO Regional Committee for South East Asia Tenth Session Rangoon  |
| 16-27 September | Pan American Sanitary Organization Directing Council X Meeting/<br>WHO Regional Committee for the Americas Ninth Session Washington D C |
| 23 27 September | WHO Regional Committee for The Eastern Mediterranean Sub-Committee A Alexandria   |
| 7 11 October    | WHO Regional Committee for the Eastern Mediterranean Sub-Committee B  |
| 23 28 October   | Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel Geneva                                      |

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Tentative

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

myelitis in humans is much less advanced and the Swedish delegate suggested that data should be collected on the efficacy of vaccination programmes for the information of Member States planning future programmes. This proposal was strongly supported and it was suggested that WHO should institute a survey by means of a questionnaire in all countries where a start has been made with preventive vaccination and should study the question of the organization of campaigns which are liable to be expensive and to give rise to a number of administrative difficulties.

### Treponematoses and venereal diseases

The eradication programmes are progressing in all the countries engaged in combating these diseases. In Indonesia many millions of cases have been treated and it is estimated that 12 million still await treatment in a number of areas the work is in the consolidation phase and a system of surveillance has been established. In Haiti the infection rate nowhere exceeds 0.3% in a few months operations will be decentralized and will concentrate upon the detection of any individual cases which may still persist. By the end of 1956 in the Philippines more than 6 million persons had been examined and more than 260 000 cases of yaws had been detected and treated the control surveys carried out in this country in areas of initial high prevalence have shown a progressive drop to rates of under 2% for active cases and less than 0.5% for infectious cases. In Albania as a result of mass case finding and treatment operations there has been a very marked reduction in congenital syphilis. In Morocco the campaign for the control of venereal diseases is well under way more than a million persons were examined and treated in 1956.

The delegate of Egypt expressed the opinion that WHO's action in connexion with the control of treponematoses and in particular of yaws and syphilis in tropical areas had been remarkable. Nevertheless he considered that some attention should be

given to the problem of reactions to antibiotics and to other drugs used in mass treatment seeing that this is a problem which has to be faced by the public health administrator and physician.

### Leprosy

The delegate of India called for a considerable expansion of activities for the control of leprosy and expressed the hope that WHO would adopt a programme in this field as broad in scope as those undertaken for the control of malaria and tuberculosis. Leprosy he said is a very serious problem in India where there are about 1 1/2 million sufferers from the disease. The national authorities have taken large scale measures but they need the help of WHO and the other international organizations especially in connexion with the new methods of treatment.

The Thailand delegate congratulated WHO on the efforts made to substitute domiciliary sulfone therapy for expensive and prolonged hospital treatment and for life long isolation of patients in leprosaria or leper colonies. Thailand intends introducing a five year plan the first phase of which will aim at making all leprosy patients in the country non-contagious. According to an approximate estimate made on the basis of sample surveys there are 100 000 patients in Thailand.

In the Philippines leprosy cases of all types number about 20 000 or roughly one per 1000 of the population. Apart from the epidemiological work and domiciliary treatment carried out in liaison with the WHO leprosy control programme the National Leprosy Service has begun to use plastic surgery as a means of rehabilitating patients who have become negative thus enabling them to resume their normal place in society. A very great educational effort is needed to persuade the mass of the people that there is no justification at all for the social ostracism of leprosy sufferers.

In Egypt the law relating to compulsory isolation is no longer applied as a result of the general confidence in the therapeutic value of sulfones. Isolation until the patient

In view of the possibility that the bacillus may develop resistance to INH and to antibiotics used in the treatment of tuberculosis it is important the Tunisian delegate held to eradicate the disease before any such resistance can develop and prejudice the measures already adopted. In Tunisia an eradication pilot project based on the use of INH as an ambulatory curative and preventive medium will commence in July and the experience acquired will certainly be useful to other countries.

The delegate of Denmark pointed out that the Danish Tuberculosis Index is not intended merely as an aid to research on BCG vaccination but rather as a large scale study of tuberculosis in his country based on a thorough examination of the population carried out by various methods in 1951 and 1952. All tuberculosis cases occurring subsequently have been compared with those recorded over the period 1951-52 in respect of which a file comprising 2 million individual cards had been established. In this way it has been possible to determine to which group the new cases belong i.e. the tuberculin positive the BCG vaccinated or the tuberculin negative groups. This study of the epidemiology of tuberculosis in a country where the disease is in the process of extinction cannot fail to be of interest to other countries which are about to enter upon the eradication phase.

The delegate of Ireland drew attention to the fact that it is important to continue the epidemiological study of tuberculosis even if only for the purpose of determining which case finding methods are best adapted to the particular conditions of the various countries. In the last resort he said the success of chemotherapy depends upon good organization of case finding and of supervision in the field.

### **Poliomyelitis**

The delegate of Argentina recalled that from January to April 1956 there was an epidemic of poliomyelitis in his country 3341 cases were registered principally among

children under two years of age and the death rate was high especially in the Buenos Aires area. Between September 1956 when the authorities introduced the free vaccination campaign and the end of the first quarter of 1957 about 2½ million children were vaccinated. From January to April 1957 only 302 cases of poliomyelitis were registered and the case fatality rate was much lower.

In Australia 3 million injections have been given without registration of any harmful effects. By the end of June 1956 95% of children under 14 years of age had received at least two injections. For the current year the poliomyelitis incidence figures are roughly 25% of those for the last three years taken together. It is not known whether this reduction is due to the vaccination measures or whether Australia is now experiencing a cycle of low incidence.

Poliomyelitis does not appear to be a serious problem in Egypt but nevertheless efforts are being made there to study its epidemiology. The delegate of Ethiopia stated that whereas the Ethiopian people appear to acquire immunity to the disease from infancy a large number of foreigners in the country seem to be affected.

The delegate of Israel stated that the disease now appears to be endemic in the Middle East and that a thorough study of its epidemiology in that region should be undertaken. A survey made in Israel showed that more than 85% of the cases were children under three years of age. A national campaign for the vaccination of all children between six months and three years has just been successfully concluded. Large scale production of a Salk type vaccine now being prepared in Israeli laboratories will make it possible to extend vaccination to other age groups and will perhaps even permit of exports.

According to the delegate of Sweden the study of the antigenic effects of vaccination in animals and in man has given satisfactory results and WHO's efforts in this direction are highly appreciated. Nevertheless the work in the field of prevention of polio

comparatively little has as yet been achieved in respect to trachoma. At the end of its second year the campaign against eye diseases will have covered the whole of the country thus eliminating the cause of 90% of the cases of blindness. The Tunisian delegate drew attention to the fact that the Tunis Trachoma Institute could provide interesting research facilities seeing that in epidemic periods it gives as many as 1000 consultations a day.

In Morocco the campaigns for the control of trachoma, including seasonal trachoma conjunctivitis have been very successful. In Indonesia on the other hand the most satisfactory method for the mass treatment of trachoma is still being sought.

The Syrian representative observed that trachoma which may lead to blindness undoubtedly constitutes a greater danger than malaria for his country and for others in the same region and he pressed for WHO to take the initiative in research to determine whether the use of dieldrin in antimalaria operations does not cause proliferation of flies and consequently an increase in the incidence of trachoma.

During the 18 months prior to the summer of 1956 1 200 000 schoolchildren were examined in Taiwan and treated by local application of antibiotics. In the present phase of the campaign the preventive aspect has become more important than the treatment of diagnosed cases. Referring to the studies recommended by the Expert Committee on Trachoma into the role of various flies suspected of contributing to the transmission of trachoma and of seasonal conjunctivitis the delegate of China declared that although trachoma is very widespread in the region to which his country belongs (it affects 45-85% of the population) no signs have been noted pointing to a variation in the incidence of the disease during the fly breeding season.

in the control of rabies. Treatment of human patients is important in countries like Egypt where animal rabies is prevalent and the number of reported cases of people bitten is high (more than 18 000 in 1956). The authorities are very anxious to see the method of administration of the hyper immune serum perfected and the serum utilized to the maximum. Since July 1954 a series of laboratory experiments and clinical tests have been in progress at the Anti Rabies Institute in Cairo to discover whether there is any justification for placing new hopes in a combined vaccine and anti serum treatment.

In China rabies causes a great deal of anxiety. The use of live avianized vaccine in animals and the combined use of phenolized vaccine and hyper immune serum (administered separately) in man have been found very effective.

The delegate of New Zealand noted with pleasure that at a moment when New Zealand is preparing to undertake research on methods of controlling hydatidosis a number of countries were taking similar steps on this disease which was of considerable health and economic importance in his country. A more efficient anthelmintic seems to be needed—one which would not only kill the worm but also destroy the eggs.

The delegate of Argentina drew attention to the inauguration in 1956 of the Pan American Centre for Zoonoses. This Centre was set up as a result of collaboration between 18 countries of Latin America, with the assistance of WHO and of United Nations Technical Assistance. It operates in a rich cattle breeding area (Azul) of the province of Buenos Aires and the cattle breeders have provided all the material and assistance needed for conducting the investigations.

The delegate of Yugoslavia expressed the hope that this example would be followed in other regions. He also emphasized the necessity in this field for collaboration between veterinary and public health services as well as between veterinary schools and schools of medicine. Students of human medicine and of veterinary medicine should,

#### Zoonoses

The Egyptian delegation noted with interest the progress made with WHO's help

is no longer contagious is now optional when this stage is reached treatment continues throughout patient services. At the present time there are 10 central and 40 branch clinics for the diagnosis and treatment of leprosy. Their number is to be increased gradually until all detected cases can be treated.

In French Equatorial Africa mobile leprosy teams have been operating for the past two years; they treat 100 000 patients.

A campaign along the same lines is being prepared in French West Africa; it is due to commence in 1957 and 300 000 patients are expected to be treated during the first year, rising to 500 000 within a short time. A similar campaign is being prepared in the French Cameroons. In Nigeria an extensive programme for the treatment of 200 000 leprosy patients is in operation; the patients are temporarily isolated and undergo treatment by the permanent or the mobile services. The same thing is being done in Rhodesia. In the Belgian Congo where 250 000 leprosy cases are being treated, the drugs are administered either orally or by injection.

Leprosy is also regressing in Greece where a new law authorizes the treatment of patients at home and there is every hope of gradually stamping out the disease.

### **Bilharziasis**

Egypt called upon the Organization to give bilharziasis the attention warranted by such a serious disease, seeing that it affects a large proportion of the world's inhabitants and in the main children; even countries at present free from the disease are by no means invulnerable. This delegate recalled the contention that there is no known single method of overcoming the disease and that it is therefore necessary to have recourse to a combination of methods. He nevertheless believes that bilharziasis can be effectively controlled by means of molluscicides; in Egypt some success has already been achieved in exterminating the intermediate host snails and completely freeing a number

of irrigation works of them. The delegate mentioned that WHO could render valuable service by facilitating delivery of the necessary molluscicides.

In Iraq too bilharziasis is a problem which may become more serious. The country is undertaking an extensive programme of economic development and the large scale irrigation projects will create new zones where conditions will favour propagation of this disease. The delegate of this country asked the Director General to consider the possibility of adopting new measures aimed at discovering at an early date an economical means of combating this scourge.

Bilharziasis and malaria are the two most important diseases in the Yemen and this country's delegate associated himself with the remarks made by the Egyptian and Iraqi delegates. Statistics show that 70% of the children of the Yemen are found at the first examination to be suffering from bilharziasis.

The Sudan delegate described what is considered a very successful snail-elimination campaign in his country. Whereas the earlier snail index was about 100 000 per kilometre of canal, it is at present in the area of operations one per two kilometres.

As the USSR delegate remarked, bilharziasis contracted in infancy hampers development and leads to almost complete invalidity at about 25 years of age. Up to the present time there is unfortunately no sure cure for the disease; the known drugs are very toxic and their utilization is limited by the fact that they cannot be administered to children, pregnant women, tuberculous persons or persons suffering from heart diseases or intestinal or gastric disorders. The delegate of the USSR considered that WHO, in addition to controlling snail vectors, should undertake the working out of a treatment which could be applied to the millions of persons already suffering from bilharziasis.

### **Fye diseases**

The measures adopted in Tunisia for the control of acute communicable eye diseases have met with great success, whereas

has launched a programme for the distribution of milk and vitamins from which about 2½ million children pregnant women and nursing mothers have benefited during the past year. A number of studies to determine the dietary habits and level of nutrition of several population groups have been carried out as well as others for the purpose of establishing the nutritive value of certain foodstuffs. Education on diet is now included in the syllabuses of elementary and secondary schools and the programmes of the nutrition courses in the universities have been reorganized.

Several delegations expressed satisfaction at the co-operation existing between UNICEF, FAO and WHO. Much appreciation was also recorded of the generous action of the Rockefeller Foundation in subsidizing research on the subject of staple foods rich in proteins through the United States National Research Council and its Committee on Protein Malnutrition. The close relationship between work capacity (and therefore earning capacity) and the level of nutrition was emphasized by the delegates of Italy and Portugal. The latter stated that he was very interested to note that studies had been undertaken on the relationship between malnutrition and certain parasitic diseases—a question likely to become important in connexion with the over-all improvement of health in the countries of Africa. His delegation would also welcome a study on work capacity as related to level of nutrition in a tropical environment.

### Health education

Several delegates voiced satisfaction at the results obtained in the field of health education of the public and the hope of seeing more and more attention paid to this aspect of WHO's work. The remark was made many times during the discussions that health education is indispensable to the success of any health programme since it is impossible to obtain the support and collaboration of the people unless they have been given prior instruction on what is required of them. The

delegate of Egypt raised the question whether the moment had not perhaps arrived for examining the possibility of organizing regional health education centres for groups of countries with common traditions, structure and language.

Attention was called to a recent study of the over-all activities of UNICEF and WHO in the field of maternal and child health—a study which clearly stressed the importance of health education. From this study it emerged quite clearly that the activities of the maternal and child health centres and of the school health services would definitely benefit from an extra educational effort in the fields of hygiene and nutrition.

### Occupational health

Here again, it was felt that there is a need for greater emphasis particularly in the countries which are being rapidly industrialized. In particular encouragement should be given to the training of the various types of personnel required and to the creation of institutes of occupational health.

The delegate of Italy expressed the view that close contact should be maintained between occupational health services and public health services—preferably by placing the two under the same leadership. In Italy as in many countries these services come under two separate ministries so that there is a tendency to develop parallel activities without inter-communication.

The delegate of India wanted to see more attention paid to rehabilitation services. Occupational health, he said, was intended to reduce the health hazards of industrialization but it could not completely fulfil its task without rehabilitation to prevent the loss to the industrial community of the services of the disabled.

### Medical rehabilitation

The delegate of the Philippines subsequently took up the point made by the delegate of India in the discussion on occupational health and urged that in setting the



he believed meet to discuss their common problems

### Other diseases

Several delegations requested an increase in activities relating to trypanosomiasis onchocerciasis tinea and infant diarrhoea and dysentery. In regard to the programme on chronic diseases attention was drawn to the desirability of including study of the problem of multiple sclerosis which is one of concern to many European countries including those of Eastern Europe.

### Maternal and child health

In view of the progress made in the control and even eradication of communicable diseases the delegate of Argentina was of the opinion that the moment was approaching when WHO would have to devote more time to questions of organization of public health services. He pointed out that since children under 15 years of age pregnant women and nursing mothers represent about two thirds of the world's population pre-natal post-natal and child care services are incontestably of paramount importance. Several delegations shared this view. Many countries make generous provision for maternal and child health services but others require assistance—primarily in the training of personnel of all categories from professors of paediatrics to auxiliary nurses.

Numerous delegations expressed their gratitude to UNICEF for the help given in this sphere. It was pointed out that the credits allocated by this Organization for activities in favour of mothers and children—most of which are carried out with the technical help of WHO—will soon reach the annual sum of \$6 000 000 and that UNICEF has agreed to subsidize schools of medicine and public health for the purpose of developing training in paediatrics.

### Nutrition

It was pointed out that malnutrition and ignorance play an almost greater role than

does poverty in infant mortality. The investigations carried out in Central America by the Institute of Nutrition of Central America and Panama have shown said the delegate of Argentina that malnutrition is one of the principal causes of mortality in children under five—mortality which in itself represents more than half the general mortality in the countries in question. This situation is repeated in other regions of the world.

In Indonesia protein deficiency is a major problem. The Central Nutrition Institute has set up schools for the training of nutritionists and assistant nutritionists and it is proposed to include elementary instruction in nutrition in the syllabuses of schools of nursing. In Africa too protein deficiency is one of the most important forms of malnutrition stated the delegate of Ghana. An attempt is being made to improve diet by means of vegetable proteins although it has not yet been proved that these can replace animal proteins. This delegate asked for careful examination of the possibility of providing Africa with healthy sources of animal proteins.

On the advice of FAO the Government of Iraq has set up a Board of Nutrition on which various ministries are represented and has established a National Nutrition Institute equipped with 20 beds. Schoolchildren to the number of 240 000 have this year been given supplementary feeding. The Government of the Philippines expressed thanks for the assistance received from WHO in this field as a result of the rice enrichment programme there has been a considerable reduction of the anaemia caused by malnutrition and avitaminosis. In addition 230 000 children benefit each day from the UNICEF distribution programme supplementary rations and medicaments are supplied to 500 puericulture centres and 867 rural health units.

In Egypt the Ministry of Health in conjunction with the Ministry of Agriculture has established a set of directives which constitute a short term nutrition policy for the country as a whole. With the assistance of UNICEF and of CARE the Government

pace with technical progress in the food industry and when new additives are placed on the market it is not easy to obtain reliable information about them. In order to save individual countries from the necessity of undertaking independent research the New Zealand delegate together with the delegates of Germany and Australia requested the Director General to collect information from the literature and research laboratories of the various countries and send this out to governments in an appropriate form.

#### Environmental sanitation

The countries in some regions stated the delegate of Ceylon are confronted by elementary sanitation problems of water supply and excreta disposal which are as difficult for them to solve as problems of water fluoridation and elimination of radioactive waste are for others. In Ceylon the most serious of the communicable diseases have been successfully overcome but at the present time every sixth outpatient and every eighth hospital patient are suffering from diseases due to defective environmental sanitation.

The representative of Ghana said his country's chief problem was to provide drinking water supplies. In Ghana, as in many other tropical countries large towns spring up with no provision for drainage and continue to develop without regard to excreta disposal facilities. Public health officials demand the necessary installations—but obtaining these is another matter.

The delegate of Greece stated that the rural sanitation programme undertaken in Macedonia with the assistance of WHO and UNICEF had resulted in a spectacular drop in morbidity rates in the region.

The delegate of Italy expressed the view that doctors should be encouraged to participate in the seminars organized for the purpose of studying certain aspects of environmental sanitation; this would enable them to become better acquainted with sanitary engineering problems. The same

delegate was also of the opinion that epidemiological studies should always be carried out prior to the implementation of any environmental sanitation programmes in order to ensure that the available funds are put to the best possible use.

#### Rural health

It was recalled that among its public health projects WHO gives first priority to those related to the development of rural health services.

The delegate of India stated that the WHO Regional Office for South East Asia is giving very valuable assistance to his country in connexion with a scheme for the establishment of 3000 rural health centres during the next four years. Each of these centres which will cover both the curative and the preventive aspects of public health is to serve about 60 000 people.

A similar development is taking place in the Philippines. The delegate of the Philippines announced that the rural health programme in his country has been transformed into an effective network of about 1200 rural health stations scattered throughout all the provinces and employing more than 4000 persons on a full time basis. Each rural health station is staffed by a physician, a public health nurse, a midwife, a dentist and a sanitary inspector.

#### Nursing

The implementation of public health programmes continues to be hampered—the delegate of Yugoslavia pointed out—by the fact that nursing training is still deficient in many respects. Attention was focused on this problem in the fruitful technical discussions held at the Ninth World Health Assembly. In this delegate's view WHO should encourage the development of polyvalent nursing training which would qualify nurses for work in various branches of public health administration and field activities.

According to the United States delegate the effectiveness of public health programmes

priorities of the WHO programme the claims of medical rehabilitation should not be overlooked

The general trend towards industrialization—he said—responsible as it is for large movements of population from rural areas to industrial centres brings with it an increase in the numbers both of industrial and of traffic accidents. With this growing number of disabled in the population the question of medical rehabilitation becomes of major importance particularly for countries like the Philippines which are undergoing rapid industrialization. But these countries need advice and technical assistance in their efforts to establish the necessary services and thus far—for reasons of more urgent priority which he well understood—WHO has left this activity largely to other organizations. The proposal in the 1958 programme to convene an expert committee on medical rehabilitation heralded a more active interest which he warmly welcomed.

### Mental health

Great interest was shown in problems of mental health. It was suggested that the state of nervous depression which is often detected in useful citizens may be closely related to economic difficulties with which they are confronted in the communities in which they live and perhaps also in part to permanent tension due to the conflict between the great creative forces on the one hand and the modern means of destruction which threaten the present generation on the other. Another point made was to the effect that there is no doubt that the stigma which attaches to mental disease is a constant obstacle to preventive and curative action.

Measures for the improvement of community psychiatric services might include modernization of psychiatric hospitals, extra-mural facilities for early and follow-up care, study of measures for the prevention of mental disorders, creation of out-patient mental health clinics attached to general hospitals, psychological training of public health personnel, education of the public

instruction of mothers in regard to the child's psychological needs, improvement of housing conditions, better opportunities for recreation, the provision of social security for old age, disability and unemployment, improvement of social and economic conditions in rural and industrial communities, research in mental health.

### Dental health

The representative of the United States of America remarked that although diseases of the teeth and their supporting structure are rarely evident in mortality tables, these conditions undoubtedly aggravate numerous morbid conditions. Dental health activities deserving consideration include epidemiological studies, preventive programmes and educational programmes. Emphasis should be laid on treatment only in so far as diseases of the teeth and jaw are prejudicial to effective general health care.

The delegate of Venezuela expressed the view that activities in this field should be directed no longer solely to schoolchildren but also to adults or at least to that part of the adult population which is already served by local health centres.

The delegate of Egypt stated that many countries including his own would like WHO to publish an authoritative report on the effects of water fluoridation. In this connexion the delegate of Turkey pointed out that a large proportion of the inhabitants of his country are suffering from fluorosis due to excessive fluorine in drinking water. (In fact WHO's plans of action in this domain are already well advanced. An Expert Committee on the Public Health Aspects of Water Fluoridation is to meet in August of this year.)

### Food additives

A number of delegations expressed satisfaction at the interest WHO is taking in the question of food additives. According to the delegate of New Zealand it is difficult for governments of small countries to keep

work of Dr Shousha Regional Director for the Eastern Mediterranean who is leaving the Organization

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At the end of this debate during which the Deputy Director General the Assistant Directors General in charge of Departments and the Regional Directors replied to questions put by delegations the Assembly noted with satisfaction the manner in which the programme was planned and carried out during 1956 in accordance with the Organization's established policies and commended the Director General on the work accomplished

#### EFFECTIVE WORKING BUDGET AND BUDGET LEVEL FOR 1958

The Assembly decided that the effective working budget for 1958 should be US\$13 566 130 and that the budget level for 1958 should be established in an amount equal to the effective working budget plus the assessments on inactive Members and on China

In connexion with WHO's participation in the Expanded Programme of Technical Assistance the Assembly expressed its satisfaction at the improved financial stability of the Programme. It also called the attention of Member States to the fact that their central co-ordinating authorities should give active support to regional projects in the Technical Assistance Programme in which they wished to participate in 1958 and future years

#### PROGRAMME FOR 1958

The proposed programme submitted by the Director General contains a description of country and inter-country programmes work under the Technical Assistance Programme programmes jointly assisted by WHO and UNICEF and additional projects requested by governments. Professor Canaperia reported to the Assembly on the prin-

cipal trends noted by the Executive Board. These include the development of local health services particularly in rural areas the development and improvement of public health laboratories the expansion of work on nutrition the work on mental health with particular reference to the social conditions that give rise to mental disorders especially those connected with industrialization malaria eradication yellow fever smallpox and the treponematoses. Lastly a special place has been given to the health problems arising in connexion with the peaceful uses of atomic energy

#### Malaria eradication

The Director General in submitting his report on the implementation of the resolutions adopted by the Eighth and Ninth World Health Assemblies with respect to intensification of antimalaria measures and eradication of the disease mentioned that the Organization had attempted within the limits of its resources to assist governments in their antimalaria activities. To this end it has organized a certain number of meetings and regional and inter regional conferences. It has given technical advice and sent out advisory teams on malaria eradication to a number of countries. It has promoted and co-ordinated research on such questions as the sorption of insecticides by mud walls and the use of chemotherapeutic substances combined with common salt. In connexion with vector resistance the Organization is working on a vast research programme which includes study of the physiology biochemistry and genetics of resistance the devising of techniques for testing anopheline susceptibility and investigation of liability to resistance in particular species.

The Director General pointed out that the Expert Committee on Malaria and malariologists all the world over are agreed that malaria eradication in many areas is no longer a technical but an administrative and financial problem. By March 1957 63 countries and territories had adopted eradication as the aim of their antimalaria

depends to a very large extent on the public health nurse's contacts with families particularly in rural areas the importance of the nurse's role in over all health programmes is too frequently overlooked

The value of training auxiliary nursing personnel was stressed in discussion. The Costa Rica School of Nursing was cited as one example of a school that has instituted a special course for this purpose. Venezuela also has courses for the training of auxiliary nursing personnel for work in the country's public health services

### Professional education and training

The discussions on this part of the Organization's activities were summed up by the President of the Assembly in these words

We were all very impressed. I am sure by the results of the review undertaken by the Assembly of the programmes of the Organization for promoting education and training of all types of health personnel. The most important features of these programmes are in my opinion the expansion of training facilities within the regions where the need is the greatest the emphasis placed on the training of teachers and the assistance to training schools in all parts of the world. I wish especially to commend also the keen interest WHO continues to take in adjusting medical curricula to the needs of the modern world. The fact that by the end of 1956 the fellowship programme had reached the six thousand mark is symbolic of the importance of this part of WHO's efforts the success of which will determine to a very considerable degree whether we shall be able to achieve the long term objectives we are pursuing.

Reference was repeatedly made in the debates to the shortage in some countries of all types of health personnel. This is particularly acute in the countries where the development of health services is in the initial stage.

As in previous Health Assemblies many speakers stressed the need for reorganizing the medical school curricula—both under graduate and post graduate—to provide more

training in social and preventive medicine. WHO has in fact adopted a long term programme designed to bring this about.

Speaking on this subject the delegate of Yugoslavia deplored the fact that many professors are disinclined to include social and preventive medicine in the pre-clinical curriculum. He took the view that instruction in these subjects should be linked with biology as well as physiology and pathology and that pre-clinical studies should also include some basic instruction in health statistics. He further believed that training needed to be so organized as to ensure collaboration between physicians veterinarians sanitary engineers nurses and the other health workers.

The delegate of Cuba reported that many schools of medicine in the Americas had reorganized their curricula with the object of interesting the student in the preventive aspects of medicine right from the start of his training. The setting up of special schools of public health in Mexico Chile Brazil Puerto Rico and Cuba bear witness to the great effort in this direction made by the countries of the Region.

The Soviet Union—stated its delegate—has acquired a great deal of experience in medical and para medical training and its health authorities are ready to collaborate in WHO's professional education and training programme.

Several delegations expressed the wish that more use should be made of fellowships in order to expand professional education and training. The health authorities in Poland—it was stated—are especially interested in WHO's fellowship programme. 75% of the doctors in Poland have qualified only during the last seven years and most of them would welcome the opportunity to pursue advanced studies in their respective specialities.

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In the course of the discussion relating to examination of the Director General's annual report for 1956 tributes were paid to the

means of studying the incidence of diseases the world over. Nevertheless the data need to be communicated and circulated more rapidly.

A number of delegations wanted WHO to pay more attention to the establishment of international standards in morbidity statistics. The publication of a handbook setting out the guiding principles for a health statistics system would constitute a useful complement to the United Nations handbook on *Principles for a Vital Statistics System*.

It was pointed out that national surveys of health conditions had been undertaken in several countries (Canada, Denmark, Japan, the United Kingdom and the United States) but that many of the techniques applied are still in the experimental stage. For this reason delegates felt it would be desirable for national vital and health statistics committees to compare experiences and exchange views on methods and procedures for carrying out such surveys.

Various delegates expressed the opinion that the inadequacy of national statistics—which makes evaluation of health conditions in various parts of the world difficult—is due as much to social and administrative as to purely technical causes. Although the adoption of international standards would be important for many countries, there is no doubt that the establishment of rational vital and health statistics systems adapted to the social and administrative structures of the various countries raises certain problems of methodology. On the proposal of the delegate of the United States, the Assembly requested the Director General to consider the measures by which the Organization, in collaboration with the United Nations where appropriate, can most effectively continue to assist in the development of both the technical and programme aspects of vital and health statistics systems, bearing in mind that such measures might include an appraisal of the various types of technical and administrative procedures most likely to meet the needs of such systems in different types of social and administrative framework, the analysis and interchange of information on

national experience and the further development and establishment of international standards in health statistics.

### Epidemiology of cancer

The Assembly unanimously adopted a resolution relating to the epidemiology of cancer sponsored by the delegations of Australia, France, Iran, Netherlands, Poland, United Kingdom, USSR and United States of America. In this resolution the Tenth World Health Assembly declared itself as

aware that cancer is a source of untold suffering to thousands of people that it casts a shadow over many a home and that its repercussions cannot fail to have a considerable impact on economic and social well-being especially in countries with an ageing population.

It also noted that cancer puts an end to the lives of thousands of people each day throughout the world and that its problems continue to baffle the research of medical science.

Under this resolution, the Organization is to undertake an important programme of research on cancer epidemiology. To this end the Director General is requested to continue the collection and publication of international statistics, mainly of mortality but also of morbidity so far as practicable and to organize an advisory centre on the objectives and methods of cancer registration. The work on the formulation of international definitions of nomenclature and statistical classification including cancer staging is to be continued (a study group on histological definitions of cancer types is meeting in Oslo from 24 to 28 June 1957). The Director General is to consider the desirability and urgency of co-ordinating and expanding work on cancer epidemiology and statistics for the purpose of contributing more effectively to national needs through improved international liaison.

The Assembly recommended that in work on cancer epidemiology care should be taken to bear in mind the occupational and other environmental conditions likely to have an

activities<sup>3</sup> That an eradication programme being limited in time is much more economical in the long run than a control programme—which is unending—does not overcome the hard fact that for the period of the eradication programme the annual expenditure will be higher than for the current control measures Yet there is only just over \$100 000 in the Malaria Eradication Special Account The Director General informed the Assembly that unless large credits are made available immediately for areas where malaria eradication is feasible but cannot be effected without substantial outside aid it will not be possible to bring the programme to a successful conclusion

Most of the delegations of countries and territories which are engaged in or are making financial and technical contributions to the fight against malaria participated in the discussion on the report at the end of which the Assembly adopted a resolution the gist of which is given below

After noting with satisfaction the ever increasing number of countries and territories which have adopted malaria eradication as the objective of their antimalaria policy and recognizing that malaria is one of the major obstacles to improving the standard of health throughout the world the Assembly considering that malaria eradication may not be implemented unless extraordinary financial assistance is available to many countries over a period of time requested the Executive Board and the Director General to take definite and specific steps with a view to obtaining contributions to the Malaria Eradication Special Account from all possible sources so as to enable the Organization to provide increased assistance towards achieving world wide malaria eradication

Furthermore considering that with the progress of malaria eradication programmes in some areas it becomes more and more desirable that countries bordering on the eradication areas should also carry out a

programme of eradication or at least apply effective control measures in an appropriate zone along the frontiers the Assembly requested the Director General to stimulate inter country arrangements with a view to minimizing the danger of importation of sources of infection and to request all governments to supply information not less frequently than once a year with regard to the development of their malaria eradication or malaria control programmes so that up to date information may be centralized in WHO and circulated to interested governments

Finally being aware of the necessity for developing research on problems now existing or liable to arise in connexion with the eradication of malaria the Assembly invited governments to offer the collaboration of appropriate institutes for carrying out the investigations to be designated by experts and requested the Director General to stimulate and co ordinate such research

### Health and vital statistics

The Assembly considered that the development of systematic procedures for the securing of adequate vital and health statistics was of basic importance to public health and recognized the major contribution already made by the Organization in the field of classification of diseases injuries and causes of death

In discussion several delegates referred to the imperative need for more accurate information on the health hazards to which populations in various parts of the world are exposed It was admitted that epidemiology (a term still little used in relation to non communicable diseases) could be the first pointer to the etiology of chronic diseases greater attention should be paid it was contended to the anthropogenetic aspect of epidemiology seeing that in this field there is a lack not only of knowledge but also of trained specialists throughout the world

In the opinion of many delegates the statistics compiled by WHO are of real value as they provide the only available

For further details of the progress of the work of the World Health Organization in 1956 10 354 1957 11 3 133 136

The solution to this problem may lie in the very early immunization of children with a Salk or Salk type vaccine after which the injection of the "cocktail" type of prophylactic might be feasible. It was pointed out that this matter calls for very serious consideration and is a cause of concern to public health administrators.

Finally a number of delegations expressed the hope that WHO would be able to help their respective countries to obtain the vaccines they need particularly in case of epidemics.

### Peaceful uses of atomic energy

The Tenth World Health Assembly approved the steps taken by the Director General for the implementation of the resolution adopted by the Ninth World Health Assembly in 1956 and requested him to continue WHO's collaboration with the United Nations with the other interested specialized agencies and with competent non governmental organizations in this matter. It noted with satisfaction that the Director General as authorized by the Executive Board has initiated discussions with the Executive Secretary of the Preparatory Commission of the International Atomic Energy Agency with a view to concluding an agreement between the two organizations on the basis of the agreements entered into between WHO and the specialized agencies.

During the discussion it was pointed out that the number of experts in this field is extremely limited at the present time and the training of radiation health physicists and of experienced medical personnel in the health aspects of the use of nuclear energy was unanimously considered to take first priority in WHO's programme. To this end it was stated the Organization should endeavour to award the maximum possible number of fellowships and to organize training courses.

The urgent necessity for assembling and circulating information on the somatic and genetic effects of cumulative doses of radia-

tion was repeatedly stressed during the debate. In this connexion the work of a Study Group on the Effect of Radiation on Human Heredity<sup>1</sup>—which met in 1955 in Copenhagen—was deemed of great value.

Several delegates stressed the potential dangers of the uncontrolled use of X rays and radioactive substances in the diagnosis and treatment of disease. The United Nations Scientific Committee on the Effects of Atomic Radiation has in fact addressed a letter to the medical press calling attention to these dangers.

It was also pointed out that in spite of the assurances given the construction of new atomic reactors and the current methods of radioactive waste disposal are in some cases causing public anxiety and it was advocated that WHO should take steps to study all the problems involved including psychological and social factors and to disseminate the results to the public in an effort to dispel this concern.

In application of WHO's plan of action which was established in broad outline at the last Health Assembly the programme for 1957 includes *inter alia* the following activities: the convening of an expert committee on professional and technical education to examine the subject of graduate public health training in atomic energy; the meeting of an expert committee on atomic energy in relation to health to study the introduction of radiation medicine into the undergraduate medical curriculum; the convening of a study group on the mental health aspects of the peaceful uses of atomic energy; the organization of an international course on health physics at Zurich in co-operation with the USA Atomic Energy Commission and the Swiss authorities for the benefit of countries from different regions (a similar course was held late in 1955 in Stockholm). The proposals for the 1958 programme include *inter alia* the convening of an expert committee to recom-

<sup>1</sup> A review of the report of this Study Group will appear in the summer of the *Chronicle*.

The letter is to be published in the summer of the *Chronicle*.



influence on the frequency of the various forms of the disease and therefore to be of etiological significance. Among possible carcinogenic factors the following were mentioned during the debates: air pollution in towns, certain types of water pollution, proximity of electrical plant, existence of oil or noxious gases in the sub-soil, certain occupations and professions, food additives, certain diseases (in some regions it has been found that 5% of cancer is associated with bilharziasis) and cumulative doses of radiation as a result of increased utilization of X rays.

It was pointed out during the discussion that the relationship of cancer and leukaemia to heredity deserved study.

### Evaluation and production of vaccines

The Director General submitted to the Assembly a report on progress made in the evaluation and production of typhoid, smallpox and triple diphtheria, pertussis, tetanus vaccines.<sup>4</sup>

The controlled field trials carried out in Yugoslavia of two typhoid vaccines, one heat killed and phenol preserved and the other alcohol killed and alcohol preserved, have clearly demonstrated that current laboratory tests of these vaccines do not permit the prediction of clinical results in man. Typhoid vaccines which confer a certain degree of protection do exist but the techniques for their production and the best biological assays to be applied to them have still to be worked out.

It is now possible to prepare a dried smallpox vaccine which will still give 100% successful primary vaccinations after exposure at 45°C for two years. A description of the method has been passed on to governments and interested laboratories.

Studies of the pertussis (whooping cough) vaccine have shown that there is a definite correlation between laboratory tests and the protection afforded to children and an international standard has been established for

this vaccine. The Organization has also undertaken or planned studies on the efficacy, potency, safety and biological standardization of other vaccines such as those against rabies, yellow fever, poliomyelitis, influenza and cholera.

During the examination of the report a number of delegates joined in asking that WHO should endeavour to encourage work on a good mixed (cocktail) vaccine in view of the fact that it is difficult to persuade mothers to subject their children to several injections.

The Assembly noted the report in question and recommended that in countries where the use of dried smallpox vaccines would be preferable for climatic or other reasons, advantage should be taken of the availability of a method for producing a consistent and stable vaccine. It also requested the Director General to continue studies on these and other vaccines, bearing in mind the desirability of conferring effective protection against the greatest possible number of diseases in the smallest possible number of doses.

Attention was drawn to the fact that in the USSR a polyvalent vaccine has been produced against typhus, paratyphoid A and B, Sonne dysentery, Flexner dysentery, cholera and tetanus antitoxin. This has been shown to be stable for a number of years. The component antigens are very easy to assay; they are concentrated in a special preparation of aluminium hydroxide which is deposited in the organism and absorbed slowly. A number of other dried vaccines are also prepared in the USSR, in particular a vaccine against smallpox for use in the hot regions of the country; these vaccines stand up to temperatures of 75°C and are almost 100% successful in primary vaccination of children.

The Assembly's attention was drawn to a statistical survey carried out in the United Kingdom which demonstrates beyond any doubt that prophylactics containing an aluminium element or mixed prophylactics, however bland, carry an increasing risk of poliomyelitis in the presence of the poliovirus.

<sup>4</sup> A detailed account of this report will appear in the number of the *Chronicle*.

memorative Session" and will be held immediately before the eleventh regular session of the Assembly

## Place of the Eleventh World Health Assembly

The Tenth World Health Assembly accepted the invitation of the Government of the United States of America to hold the Organization's Tenth Anniversary Session the Eleventh World Health Assembly and the

session of the Executive Board following that Assembly in the United States

## Technical discussions

It was decided to postpone to the Twelfth World Health Assembly the technical discussions on "Health Education of the Public" which were scheduled to take place during the Eleventh World Health Assembly in order to avoid any prolongation of the total duration of the 1958 special and ordinary sessions

## LÉON BERNARD FOUNDATION PRIZE

The Tenth World Health Assembly awarded the Leon Bernard Foundation Medal and Prize to Professor Marein Kacprzak Rector of the Warsaw Academy of Medicine for his outstanding contribution and practical achievements in the field of organization of public health services and social medicine. The previous recipients of this honour awarded in recognition of their eminent services in the field of social medicine have been Dr W. A. Sawyer (United States of America), Dr Rene Saad (Belgium), Dr C. E. A. Winslow (United States of America), Dr Johannes Frandsen (Denmark), Professor J. Parisot (France) and Dr A. Stampar (Yugoslavia).

On behalf of the Assembly the President, Dr S. Al Wahbi, presented the Prize to Professor Kacprzak and gave an outline of his career and work.

Professor Kacprzak was born in 1888 at Podolzyce in the province of Warsaw. He did his secondary studies at the college of Plock and then went to Paris to take the course at the Faculty of Medicine. He qualified as physician at Kharkov in Russia in 1915. His Doctor of Medicine degree was awarded by the Jagell University of Cracow.

After the First World War Professor Kacprzak did a period as medical sanitarian at Warsaw and in 1922 went to the United States to study public health for two years at the Johns Hopkins University, Baltimore. He obtained his public health and hygiene diploma in 1924 and returned to establish himself in Poland.



Professor Marein Kacprzak delivering a plenary speech

Professor Kacprzak began his work as chief de service at the State School of Hygiene which formed part of the Institute of Hygiene of which he is still a member. In 1946 Professor Kacprzak was appointed regular Professor of Hygiene at Warsaw. He was Dean for five years and was appointed Rector of the Warsaw Academy of Medicine in 1953.

mend methods of radiochemical analysis for application in the field of health the convening of a second study group on the effects of radiation on human heredity a seminar on radioactive waste disposal and a further course on radiation protection to be held in South East Asia

## OTHER DECISIONS OF THE ASSEMBLY

### Executive Board

The Assembly noted the Executive Board's reports on its eighteenth<sup>7</sup> and nineteenth sessions<sup>8</sup> and commended the Board on the work it had performed

The following States were empowered to designate a member to serve on the Executive Board Afghanistan Australia Egypt Federal Republic of Germany Liberia United States of America

### Resumption of active participation by certain Members

The Assembly expressed the hope that the Member States which have not as yet notified the Director General of their decision to resume active participation in the work of the Organization will do so in the near future

### Relations with UNICEF

The Assembly reiterated its satisfaction on the close and effective liaison between the two organizations. It noted with satisfaction the decision of the UNICEF Executive Board to lay emphasis on assistance for malaria eradication and to retain up to the end of 1961 the ceiling of \$10 000 000 per year set in 1956 for this purpose. It was noted with satisfaction too that UNICEF has approved the principle of grants in aid to certain schools of medicine and public health to help them to start or to strengthen the teaching of paediatrics and preventive medicine

### Protection and integration of indigenous populations

After studying the proposed Convention and Recommendation concerning the Protection and Integration of Indigenous and other Tribal and Semi Tribal Populations in Independent Countries which was to be submitted to the fortieth session of the International Labour Conference for final adoption the Assembly approved the text of those provisions of the proposed Convention and Recommendation relating to health and agreed that WHO should associate itself with the application of the proposed Convention

### Broad programmes of the United Nations and the specialized agencies in the social and economic fields

The Assembly noted with satisfaction the successful efforts made to ensure collaboration between the United Nations and the specialized agencies at the secretariat level in fields of common interest and expressed the hope that this collaboration would continue to develop

### Renewal of the Director General's contract

Recognizing that the services performed by Dr Candau have contributed enormously to the successful operation of the World Health Organization the Assembly expressed the view that it was desirable that Dr Candau should continue as Director General for a period beyond the date of expiry of his present mandate and in consequence decided to renew his contract for a period not exceeding five years from 21 July 1958. Dr Candau was invited to communicate his decision to the President of the Tenth World Health Assembly on or before 1 November 1957

### Celebration of the tenth anniversary of WHO

A special session of the World Health Assembly is to be convened in 1958. It will be known as the "Tenth Anniversary Com

Off R c Wld Hlth Org 73  
Off R c Wld Hlth Org 76 and 77

Medicine during the past few decades has achieved great successes and in some fields the results obtained go beyond the boldest dreams—not only the dreams of our fathers but also those that the physicians of my generation cherished in the days of their youth. One might even say that the trends of modern medicine have surpassed our boldest dreams both in the field of science and in medical arts.

When a hundred years ago Virchow and his followers began to concern themselves with social medicine their statements had something apostolic about them. Later one even began to believe that social medicine would be able to do away with the diseases arising from the vices of civilization and social injustice. How far we are today from that Utopia but historically necessary concept. Nowadays we regard social medicine as a science whose practical application is not only to the so-called social diseases but to all the other diseases as well which not confined to a single country but interests the whole world. It is in fact difficult to find today a physician who even if he theoretically rejects the concept of preventive medicine content to limit his recommendations as regards his patient merely to prescribing a drug or an operation. Nowadays prescriptions which are hygienic or social in nature accompany all therapy and make it more effective. This idea is becoming more and more familiar to every physician.

Formerly men were treated when need arose when disability, pain or death threatened. Today it is for us to choose the most suitable moment for medical intervention. Tomorrow we will search in the body for the predispositions and in the mind for social and physical environment for the harmful factors that determine the appearance and the development of disease. The whole of our medicine will be gradually transformed when it is imbued with the idea of prevention, closely linked to the improvement of social conditions. The physician will become the true medicus and no longer mendiculus. This result will be due not only to science and technical achievement but also to the fact that the physician will have become aware of the importance of the social factor which is inherent in medicine.

Our forefathers believed in a golden age in the past and we find this belief in the legends of all peoples. As proof of this I will mention the well known verses of Ovid: Aurea patena satas est aetas quae nullo spoletis auro legere

fidem recturnque colebat

We find relaxation in reading these legends of the golden age but we are not taken in by the mirage of that legendary past. We think more of the future. True we do not expect the golden age in the sense formerly given to it, but we look to the future and are convinced that our children and grandchildren will have a better life than ours. I shall not assert that in the future the conditions in which we live will be paradise nor that the lion will lie down with the antelope and the wolf with the lamb. But what is certain is that the European will feel much closer to the inhabitant of Africa and the American less distant than at present from the inhabitant of Asia. A better understanding will develop between men in which medicine will play its part.

Descartes has said: "If any means can be found that will generally make men wiser and cleverer than they have been hitherto I believe that it is to be looked for in medicine." For over three hundred years medicine has not been able to boast of any such success but the future is full of hope. Let us hear how Descartes goes on. "It is true that the medicine now in use contains little that is of outstanding utility but while I have no intention of decrying it, I feel sure there is no-one even among those who make it their profession who would not admit that what is known is next to nothing in comparison with what remains to be known and that a large number of diseases both of body and mind and perhaps even the infirmity of old age could be avoided if one had sufficient knowledge of the causes and of the remedies with which nature has provided us."

Our faith in medicine cannot be weaker than in the nineteenth century and recent discoveries enable us to prove these assertions scientifically. Today we have a profound belief in social preventive and scientific medicine. The ideas contained in these general definitions relate to a medicine that not only reaches the acme of the art but is accessible to all finds appropriate application in each case and takes into account the patient's past and future the condition of his life, work and environment.

Medicine has great tasks before it, but if its roots and its social possibilities are not taken into account, it will be impossible to make man either richer, better or happier. This is a fine and captivating vision and if I had to begin my life over again I would devote it once again to social medicine.

In the beginning was the idea, then noon traisted by law, but he hand of justice of hour was free will men lived in honor and in the now on.

At the School of Hygiene between the two wars Professor Kacprzak succeeded in organizing the systematic training of medical hygienists for the public health administration. He taught medical statistics, epidemiology and selected branches of social medicine. At the same time he lectured in hygiene at the Warsaw Polytechnic School and at the Faculty of Arts of Warsaw University. For some time he was also in charge of statistics and documentation at the Ministry of Social Affairs.

Professor Kacprzak was at the same time carrying on his scientific work on the organization of public health and on sanitary and medico-social problems in various countries. This was based on extensive studies made by him during numerous journeys throughout Europe and the United States, sometimes as the holder of Rockefeller Foundation or League of Nations Health Organisation fellowships and often on his own account. At the request of the League of Nations Health Organisation he organized a six-week visit to Poland for medical hygienists and he participated in other exchanges of this kind in other countries—Norway, Denmark, the Netherlands, France and the USSR. In connexion with Professor Kacprzak's activities in other international fields at the time of the League of Nations Health Organisation, it should be noted that he participated in the Commission on Public Health Training in the meetings of the Directors of Schools of Hygiene in the Commission on Rural Hygiene and in the preparation of the first and second conferences of rural hygiene and in the Commission on Nomenclature of Causes of Death.

After the last war Professor Kacprzak was an active member of the commission entrusted with the preparation of the Constitution of WHO and in 1946 in New York he was chief delegate of Poland to the first International Health Conference for the establishment of WHO.

These extensive studies enabled Professor Kacprzak to evolve and inculcate a concept of the organization of public health administration based on the close relationship between sickness and social conditions which would provide medical assistance to each individual regardless of his financial resources.

The work of Professor Kacprzak testifies to this thorough knowledge of the subject and shows him to be a convinced and enthusiastic worker in the social field.

The second problem which Professor Kacprzak studied was that of the low health level in rural areas related to the low economic, cultural and social levels of the rural population. Many publications on the subject were addressed to physicians, social workers and to rural populations in general.

Particular mention should be made of a monograph entitled "The Plock Rural District". Professor Kacprzak did not confine himself to studies; he also conducted propaganda on this problem demanding an improvement in hygienic and sanitary conditions in rural areas and an extension of medical services.

For thirty years Professor Kacprzak has been considered in Poland as the symbol of social medicine—medicine which relates sickness to living and working conditions and demands not only treatment but also improvement of the patient's material and social conditions. This concept of social medicine is evident not only in Professor Kacprzak's research work but also in his teaching. His students have to take a new line and realize that it is their duty to study social factors to consider the origin of sickness, its repercussions and the social means which must be employed to combat it. The present cadres of the health services in Poland may claim to be pupils of Professor Kacprzak—and this does not refer only to the highly placed public health administrators. Professor Kacprzak has known how to communicate to his students his own untiring enthusiasm for the work and this enthusiasm enables them whatever the functions they fulfil to obtain a greater output from the means of action at their disposal.

Under this same banner Professor Kacprzak has continued his activities as President of the Social Medicine Association, member of the Executive Committee of the Hygiene Society and editor of several journals including that entitled "Public Health". Public health teacher of hygiene and popular writer on these subjects, he has taken every possible opportunity of discussing social health problems with the authorities and social workers at all levels.

During the years since the last war Professor Kacprzak has concerned himself and still concerns himself very deeply with student problems and endeavours to familiarize students with the problems of social medicine. He has a great love for young people and is not only an exceptional teacher but also a man who seeks to ensure that all his students, all future physicians, shall have a modern training with a sound knowledge of the subjects taught, a true conception of their professional and social duty.

In thanking the Assembly for the high honour conferred upon him, Professor Kacprzak expressed his conviction that once medicine is at the service of all, a step will have been taken towards the greater well-being of mankind in the future.

and drew a parallel between his work as a pioneer and the international activities the World Health Organization is now carrying on in research and coordination.

Standing here before this notable Assembly on this occasion I find my emotions a mixture of pride, humility and reminiscence. I am proud to have been

I also feel humble at this time first because of my debt to a great many collaborators over the years and in many countries and secondly because my own acquaintance with current malariaology makes clear to me that this award might so properly have gone to any one of several colleagues who have contributed notably to the subject in recent years.

But even stronger than these feelings of pride and

of humility there is this morning a flood of reminiscence reminding me back a third of a century to the time when I had intimate personal and professional association with Samuel Taylor Darling, whom we honour today. In October 1923 I was sent to Leesburg, Georgia, for a routine two-week training course at the Rockefeller Foundation's Malaria Field Station of which Darling was the director. But such was Darling's magnetism, and so thoroughly and quickly did he stimulate me to specialize in malariaology that I stayed at his side for fifteen months as a student assistant. Darling's influence was irresistible and to this very day malaria has attracted me more strongly than any other aspect of medicine. Of Darling, uniquely among all of my teachers, I can say most sincerely in the words of the oath of Hippocrates: I shall look upon him who shall have taught me thus as father and as mine own parents.

Darling had a robust personality, a pertinent curiosity, abundant energy and a wealth of wisdom. He had a notable record in the Panama Canal Zone as pathologist under General Gorgas. There, as Darling several times related to me, he met Ronald Ross, the hundredth

anniversary of whose birth we note today. These two Titans had great respect for each other. After Panama, Darling joined the staff of the Rockefeller Foundation, and brilliantly carried out studies in Malaya, Java, Fiji, Brazil and the United States. His tragic death occurred in the hills above Beirut on 20 May 1945 while he was on a tour for the Malaria Commission of the Health Organization of the League of Nations.

The great lesson consistently expounded by Darling was that in public health activities, constant field and laboratory research is essential to sound practice. Darling would have given hearty



DR GENERAL

*Darling's presence at the 11th World Health Assembly*

recommended to this hour by an expert committee of outstanding malariaologists and I am very proud indeed to receive it in the presence of this Assembly. No other organization in all history has had a greater worldwide influence towards the eradication of a major disease than has the World Health Organization in respect of malaria during the past few years. This Organization has been the activating catalyst and motivating mainspring, the terrorist of all demagogues and coordinator in the development of a global assault on malaria. I have no doubt that WHO will continue to apply increasing power to the attack until this plague has been vanquished.

## DARLING FOUNDATION PRIZE

The Darling Foundation Prize is awarded periodically to honour not only eminent malariologists whose work is of particular distinction but also the memory of Dr Samuel Taylor Darling a man renowned for his constant research activities focused on the control of disease and especially the control of malaria. The previous recipients of this Prize have been Colonel S P James (1932) Professor N H Swellengrebel (1937) Professor H E Shortt and Dr P C C Garnham (1951) and Dr G Coalney and Professor G MacDonald (1954).

This year the Darling Foundation Committee decided to confer the honour on Dr P F Russell (United States of America). At a plenary meeting called specially for the purpose the President of the Tenth Health Assembly Dr S Al Wahbi handed over the Medal and Prize to Dr Russell. In doing so he remarked on the doubly solemn significance of the ceremony for the day also marked the centenary of the birth of Sir Ronald Ross.

Today is a particularly appropriate day for the presentation of an award connected with work in the field of malaria for one hundred years ago today was born the man who later became known to us as Sir Ronald Ross who first saw and recognized in August 1897 zygotes in the stomach walls of a mosquito and who thereafter first demonstrated the cycle of avian malaria from which was deduced a similar cycle in human malaria a deduction very soon proved by the Italian workers Grassi Bastianelli and Bignami.

On this most fitting occasion the award is being made to one who is renowned for his outstanding achievements in the control of malaria and indeed for his contributions to the whole subject of malariology and who it is particularly interesting to note drew his inspiration directly from Dr S T Darling working as his assistant at the Leesburg Field Laboratory Georgia shortly after joining the Rockefeller Foundation in 1923.

Dr Paul F Russell born in 1894 is an American citizen. He holds the A B degree of Boston University the M D degree of Cornell University and the M P H of Harvard University. He joined the Rockefeller Foundation in 1923 and has been associated with the health work of that foundation ever since particularly in the field of malaria. Most of his working life has been spent outside his native land for he was assigned to Malaya from 1923 to 1928 to the Philippines from 1929 to 1934 to India from 1934 to 1942 to Venezuela from 1946 to 1947 to Rome from 1950 to 1952 and to Paris from 1952 to 1953 while from 1942 to 1946 he served with the United States Army overseas and in 1954 and 1955 he was loaned to the World Health Organization acting as special consultant here in Geneva and visiting a number of countries in Asia and the Middle East.

Dr Russell has made outstanding contributions to the epidemiology and control of malaria. His brilliant studies in connexion with malaria transmitted by *Anopheles culicifacies* in South India constituted one of the earliest demonstrations of the possibility of controlling malaria through insecticidal attack on the adult vector paving the way to the similar use of residual insecticides—a technique which as we all know is the mainstay of modern malaria eradication programmes.

Dr Russell is the author or co-author of a number of books on malaria and of a long list of scientific papers. The title of his latest book—*Man's Mastery of Malaria*—excellently epitomizes the philosophy of which Dr Russell has been so strong a protagonist a philosophy which guides also this Organization in its work of mastering the problem of malaria in the world.

Dr Russell has been closely associated with the World Health Organization since its inception and as a member of the Expert Advisory Panel on Malaria has served on the Expert Committee on Malaria on five occasions. In addition on several occasions the Organization has greatly benefited from the advice of Dr Russell when he agreed to serve as a consultant to the Organization.

Dr Russell in his speech of acknowledgment recalled Dr Darling's brilliant career.

and a final plenary session and for convenience in nine discussion groups with the following chairmen and rapporteurs

- Group 1 Dr M. Kacprzak, Rector of the Academy of Medicine Warsaw, Poland *Chairman* Dr B. M. Clark, Deputy Chief Health Officer, Union of South Africa *Rapporteur*
- Group 2 Dr H. K. Cowan, Chief Medical Officer, Department of Health for Scotland *Chairman* Dr M. P. V. Tottle, Adviser to the Royal Medical Board of Sweden *Rapporteur*
- Group 3 Dr M. O. Shoub, Director, Ministry of Public Health, Egypt, *Chairman* Dr C. M. Norman Williams, Assistant Director of Medical Services, Western Region, Nigeria, *Rapporteur*
- Group 4 Dr E. Akwe, Chief Medical Officer, Ghana *Chairman* Dr S. A. Chowdhury, Associate Professor of Medicine, Dacca Medical College, Pakistan *Rapporteur*
- Group 5 Professor P. Montendard, Director General of Public Health, Netherlands *Chairman* Dr C. H. Yen, Commissioner, Provincial Health Administration, Taiwan, Provincial Government *Rapporteur*
- Group 6 Dr A. Saut, Director, Federal Public Health Service, Switzerland *Chairman* Dr P. Bernard, Chief Technical Bureau, Health Service Directorate, Ministry for Overseas Territories, France *Rapporteur*
- Group 7 Dr H. Hashimoto, President, Japan Hospital Association, *Chairman* Dr R. K. C. Lee, President, Board of Health, Honolulu, Hawaii *Rapporteur*
- Group 8 Dr F. L. Stebbins, Director, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., U.S.A. *Chairman* Dr S. Syman, Deputy Director General, Ministry of Health, Israel *Rapporteur*
- Group 9 Dr C. Dar-Coller, Technical Adviser, Ministry of Health and Welfare, Mexico *Chairman* Dr A. C. Regala, Special Assistant, Department of Health, Philippines *Rapporteur*

At the opening plenary session the General Chairman, Dr A. J. Metcalfe, gave an address on the main subject from the point of view of the public health administrator. Drawing a distinction between the hospitals of the large cities and the rural areas, the Chairman gave a series of illustrations of the type of services in his own country, Australia. He referred especially to the rural services, which in many instances have to be carried to remote areas. These services, he said, are usually provided by the Government or by religious and other organizations which are frequently subsidized by the Government.

Following up this description the Chairman made special reference to the Northern Territory medical service of Australia, which is provided as a complete health service by the Commonwealth Department of Health. The Northern Territory, which covers an area of over half a million square miles, is in great part waterless and arid. Consequently the population is widely dispersed, some of the settlements being separated by hundreds of miles. An aerial medical service to the residents of these remote areas has been introduced, which is operated from two wireless bases one thousand miles apart, and all the settlers are in touch with them by special radio equipment. Medical officers make regular visits to centres of inland population and give treatment and advise on all matters that have a bearing on health. The Commonwealth Department of Health covers in this area the whole field of hospital medical and public health care.

Dr Metcalfe also dealt with special public health problems, including tuberculosis, research, out-patient services and the relation of the general practitioner to the hospital. He stressed the point that the hospital was a very important unit in the team of numerous other public health activities.

This was followed by presentation of a paper by Dr S. Al Wahbi, President of the Tenth World Health Assembly, dealing with the subject of the technical discussions from the point of view of a hospital administrator. Dr Al Wahbi pointed out that the main objectives of the hospital services were: (1) efficient diagnosis and treatment of patients with the best modern facilities; (2) research in every direction of hospital work; (3) the training of personnel at all levels from the highest grade of specialist to the auxiliary workers; and (4) health education and health protection, carrying the work of health promotion from the hospital



endorsement to the emphasis placed on this subject by Professor Parisot and to the words of your very practical and distinguished Director General in his review of the work of WHO in 1956 where Dr Candau states that research is the real backbone of the various activities through which the Organization is striving to promote world health. As regards malaria I believe that without concomitant fundamental investigations world wide eradication would

not be possible. It is indeed fortunate that this principle so tenaciously held by Darling has been accepted and that WHO is today stimulating co-ordinating and assisting malaria studies throughout the world.

Finally I have great pleasure in accepting this Darling Foundation Medal and Prize that commemorates a famous research malarialogist, a superb teacher and a close friend.

## DR SAHIB HASSAN AL WAHBI

*President of the Tenth World Health Assembly*

Dr Sahib Hassan Al Wahbi, former Minister of Health of Iraq, was born at Baghdad in 1905. He studied medicine at the American University of Beirut. After completing various periods of study in hospitals of England and Scotland, Dr Al Wahbi entered the Iraqi Health Service in 1930. He was appointed associate professor at the Baghdad Royal College of Medicine and became Assistant Dean of that institution in 1937. Since 1941 he has been directing the Karkh Hospital in Baghdad.

Dr Al Wahbi, who already represented his country at the Office International d'Hygiène Publique, has been for some years the head of the Iraqi delegation to the World Health Assembly. In 1956, he was Chairman of the WHO Executive Board.



## THE ROLE OF THE HOSPITAL IN THE PUBLIC HEALTH PROGRAMME

*Report of the Technical Discussions at the Tenth World Health Assembly*

The subject chosen for the technical discussions at the Tenth World Health Assembly was "The Role of the Hospital in the Public Health Programme". Some 200 participants attended these discussions which were held under the general chairmanship of Dr A. J. Metcalfe, Director General of Health of Australia. The participants met in an opening

In some countries especially those with a long hospital tradition the smaller hospitals notably those in rural areas are open to general practitioners. But as a rule the larger teaching hospitals have "closed staffs". It is in any case desirable that the general practitioner should have an opportunity to continue seeing his patient after admission to hospital and have the benefit of consulting with the hospital staff. The specialist staff under whom the immediate care of the patient is placed have a responsibility for informing the general practitioner of the progress of his patients in hospital and of any special treatment or follow up which ought to be undertaken after discharge.

The traditional and essential functions of the hospital are the care of the sick, the relief of suffering and where possible the restoration of the patients to health. We shall consider in a later section of this report the new approach of hospitals to the prevention of sickness and the promotion of health.

### Types of hospital

In the general pattern of hospitals the principal types which have been organized are first large hospitals rendering all the higher grades of special services e.g. brain surgery radiotherapy etc. Such services are in many instances extremely costly and could not be re-duplicated in general hospitals throughout the region. These hospitals are commonly teaching hospitals for medical students nurses and auxiliary workers and they are generally situated in large cities. There are in addition regional or district hospitals where specialized services of a less complex nature are available. These hospitals are usually situated in towns of moderate size in such a position that they can serve a region or a wide area. Patients are admitted on the recommendation of a general practitioner through the outpatient department or directly in emergency. In the third place there is a range of smaller hospitals which are essentially general in character. A number of the larger units of this group are served by general physicians who have

specialized in some subject such as midwifery or disorders of the ear nose and throat. The smaller units usually of 50 beds or less are often served entirely by general practitioners who may call in specialists for consultation as required. And lastly there is in the more remote areas and especially in the less developed countries a kind of home hospital either under the direct charge of one or more local general practitioners or served directly by a team of medical nursing and auxiliary workers from a neighbouring centre.

Generally speaking the system of organization is that the patient is admitted routinely to one of the smaller units and if it is found that more highly specialized investigation or treatment is necessary he is transferred to one of the larger regional or district hospitals where such services are available. It may be necessary for him to be transferred without delay to one of the great teaching hospitals. In many cases the flow of patients from one type of hospital to another is in both directions according to the condition of the patient. For example a patient who has been treated in a special hospital and is now convalescent may be transferred to a smaller unit near his home or if specialized services have been completed he may be referred to a more general hospital. In areas where the system of regionalized development has been applied successfully the result is a network of hospitals of various sizes established throughout the country. Small rural hospitals perhaps of 15-50 beds each serve a rural population of five to ten thousand people. They usually have general medical surgical and obstetric services with an outpatient department. At the next level is an area hospital of 70-150 beds depending on the population served. These hospitals have special departments giving medical surgical, gynaecological, obstetric, ophthalmic, urological and paediatric services. They render valuable assistance to the small rural hospitals within their area but they do not exercise administrative supervision. There is no hierarchy in the various types of hospital. At the third level is the base hospital of

to the community right into the homes of the people. This last item as Dr Al Wahbi said is a new orientation of the hospital services and its organization is one of the main subjects for the technical discussions.

The reports of the nine groups were studied by three special rapporteurs—Dr R F Bridgman, Deputy Director of Health of the Department of the Seine, France; Dr E L Crosby, Director, American Hospital Association; and Dr A A Zakı, Director of Medical Services, Sudan. Their conclusions were presented to the final plenary meeting of the technical discussions together with the reports of the groups. On these documents and on the general discussion that they gave rise to, the following final report was prepared. In keeping with the established procedure, this report was noted but not formally adopted by the Tenth World Health Assembly, since the technical discussions do not constitute part of the proceedings of the Health Assembly proper.

## THE HOSPITAL SERVICES

### THE HOSPITAL AND ITS FUNCTIONS

#### Introductory

This subject considered as a title for the technical discussions at the Tenth World Health Assembly presents unusual difficulties. In the first place a definition or at least a comprehensive description of the term hospital has to be examined in detail. Secondly, the range of size and function of hospitals is remarkably wide because one must logically include at one end of the scale the great highly specialized teaching hospital generally situated in a large city and at the other end the little rural unit of 25 beds or less. Between these are many intermediate grades of hospital, all are vital to the service. It is not the buildings that are contemplated in discussion but rather the functions that the hospitals undertake according to the needs of the communities which they serve. In the third place the discussion groups had to establish a just balance between the curative and the preventive functions of all types of hospital and to define in some measure their application and their scope.

So far as definition is concerned, groups were all but unanimous in accepting the suggestion made in the first report of the Expert Committee on Organization of Medical Care.<sup>1</sup>

The hospital is an integral part of a social and medical organization the function of which is to provide for the population complete health care, both curative and preventive, and whose out-patient services reach out to the family in its home environment. The hospital is also a centre for the training of health workers and for bio-social research.

No exact definition of general practice or specialist functions was proposed, but the trend of group discussions made it clear that the general practitioner is regarded as a doctor in direct touch with his patients in or near their homes who accepts continuing responsibility for providing or arranging for their general medical care. There was also wide agreement that in modern medicine the integration of preventive and curative functions would be most effective and most readily undertaken in the surroundings of the patient's home and family. One further feature of general practice which retains its importance everywhere is direct access of patient to doctor. In accordance with his professional training and ethics, the physician is alone responsible for the treatment and advice given to his patients and except in emergency he is the agent through whom specialist advice and if necessary admission to hospital are sought.

## The smaller units of hospital service

In remote and under developed areas the hospital may be a relatively inaccessible centre and for this reason it may have to deploy its medical nursing and auxiliary team in periodic visits to villages and small communities where a hospital could not be supported on economic grounds. In countries with poor means of transport the creation of rural health centres is of outstanding value. In some areas such units are of the nature of mobile hospitals or surgical camps provided with substantial equipment for operative work. The team visits an area undertakes the actual surgical and other

special functions and then leaves a team of competent workers to look after the patients until they are ready for discharge or require only minor dressings. It is of course essential that units or camps of this kind should be under the skilled supervision of a "base" hospital and not working in isolation. Some patients will require to be transferred to the hospital centre for specialized care and that is one of the virtues of the system. In a number of countries today there are areas in which young people will not seek work because of an almost complete want of medical services and it is here especially that the establishment of outlying health centres is of great value.

## HEALTH ACTIVITIES WITHIN THE HOSPITAL

### Introductory

Up to this point we have been considering the hospital within its traditional setting as an institution for the medical care of the sick. It is now necessary to enlarge that conception in order to be in line with present day needs. It is customary to speak about the integration of preventive and curative medicine in the hospital but the technical discussions show clearly enough that the idea has not reached practical realization except in the more remote and rural areas in which health measures and treatment can be combined without difficulty or any break with tradition. As regards hospitals we should be cautious about expressing views on the limits set between prevention and cure. It could be said for example that a surgeon who removes a tumour is doing preventive work and in one sense it is true—he is probably preventing a continued growth or a recurrence. This might best be described however as "clinical prevention" but it is properly speaking "cure". In medicine there are of course many borderline cases between the realms of prevention and cure and it would be unwise to be dogmatic about it. When we speak of preventive medicine as such we usually have in our

minds the idea of the prevention of sickness and the promotion of health rather than the preventive aspects of a particular form of treatment. The boundaries of medical science are ever changing and what is curative today may represent an important feature of prevention tomorrow.

### The aim of restoration

There are important features of preventive work in the activities of rehabilitation in which both hospitals and industrial firms play an increasing part. This is especially significant when we realize that it is the patient as a person and not the disabled part which has to be considered. The aim of restoration to full functional activity is an important feature of a health service and much of this work has to be done in the course of hospital treatment. The same considerations apply to the care of the mentally sick especially in the early stages of disorder. The psychiatrist in the out-patient clinic with the assistance of the psychiatric social worker in the home makes a direct and valuable contribution to prevention and all these are health activities in the fullest sense of the term.

perhaps 600 beds or more where every kind of specialized care is available. These hospitals offer consultation and assistance to the intermediate grade of hospital and receive from them patients requiring highly specialized diagnostic and therapeutic care. In the more remote areas and especially in the under developed countries there are smaller clinics some stationary and some mobile dealing with the routine medical care for the area they serve.

Hospitals of these types are to be found whether or not there is a regional system. We shall later discuss the special value of regionalization. Where the various hospitals whether governmental or voluntary are scattered throughout an area there is usually a certain lack of co ordination and equipment and services may in this way be unnecessarily duplicated.

### Specialization

The remarkable advances in scientific medicine during the past generation have led to a great increase in specialized services and equipment. The cost of such work makes it no longer possible to maintain the highest degree of progress without a properly rationalized system in which each hospital of a group renders the service which it is best fitted to undertake. As we have seen the differences between hospitals today are now so great that we have to draw a clear distinction between the various types and to study integration at different levels. Not only this but recently the need has arisen in each country for a special centre for scientific medicine combining in one unit the skills of pure science and their application by means of clinical medicine to the needs of patients suffering from special and complicated diseases such as the cancer group. This clinical research centre must be permitted to select its own patients in the interests of its research programme. The problems might be nutritional or concerned with certain specific diseases but in all cases it would be necessary to secure accurate recording of experiment and result and

careful scientifically controlled epidemiological and statistical studies.

Specialized equipment may now involve huge expenditures and we are bound to consider the variations between one area and another. Probably the best method of meeting the difficulties of the less developed areas is to create through an international organization a number of special regional centres in which costly and delicate equipment could be housed. In some instances it might be necessary to transfer a patient over long distances to secure treatment of this kind while in others the use of mobile equipment might be feasible.

### General medical care

In spite of the wide range of specialties the great bulk of hospital service in most countries will continue to be devoted to general medical care. This term includes the recognized specialties of the general hospital such as surgery and obstetrics and at the regional or provincial level the hospital should be a centre for scientific medicine. It should not be assumed that only the highly specialized hospitals are capable of undertaking scientific research. Indeed some of the best scientific work in the annals of medicine has been carried out in small and often remote units and an increasing amount of field investigation is being done through co operation between general practitioners. One of the principal functions of the larger research centres is to inspire to assist in planning and to co ordinate.

The contribution of the smaller hospitals to medical care has both a medical and a social significance. It is in the units of fifty beds or less that the physician admits patients on social as well as on strictly medical grounds often on account of unsuitable home conditions. Such cases readily provide opportunities for close collaboration between the general practitioner and the local medical officer of health especially in the solution of difficulties which are social rather than medical.

(a) *Pure scientific research* not directly related to the care of the sick. This includes physiological studies of function to elucidate such problems as blood flow the effects of ingestion of certain fats on the cardiovascular system and so on

(b) *Specific pathological bacteriological and other research* making use of clinical material e.g. biopsy pathological specimens from autopsy and the growth of cultures

(c) *Statistical and epidemiological research* through the medium of hospital records. The use of documents from hospital archives and laboratories is essential for the maintenance of a sound public health programme. For example the control of social diseases must be organized on the basis of accurate knowledge of the number and condition of patients and good prophylactic measures can only be founded on well tested therapeutic discoveries and the latest developments in diagnostic media

(d) *Field research* through the collaboration of the health officer and the general practitioner. The practitioner has the advantage of continuity of observation and of knowing intimately the family and neighbourhood background of his patients

The health officer on his part has a unique understanding of the community problems of his area including the broader aspects of epidemiology

(e) *Social research* is finding a new place in public health. Medicine today has become a social as well as a physical science. In this kind of research the centre of interest is the patient and the social scientist is concerned with his reactions to the stress of illness and the effects on him and his family of the social difficulties created by admission to hospital. In the hospital itself socio-medical inquiries are of value in the study of psychosomatic illness and in the investigation of social and economic factors in sickness

(f) *Administrative research*. In the field of hospital administration there is considerable scope for skilled investigation. The hospital of today has to keep its house in order and for this purpose it has to make studies of its own financial and economic procedures. Further the hospital service has to satisfy the public that its professional services are maintained at a high level considering the nature of the area it covers and the resources available. Standards of medical care are in need of regular review by an independent authority governmental or otherwise

## HEALTH CARE OUTSIDE THE HOSPITAL

### The out patient department

One of the fundamental principles of modern hospital care has been due to a change of attitude towards the external functions of the hospital. The participants of the nine groups regarded the role of the out patient department as an essential part of the pattern of public health services. These extra mural activities they felt were a practical demonstration of the truth that the modern hospital looks out beyond its own walls to serve the community. The hospital should not live in isolation but its functions should permeate the community

through the services of the out patient department. In this unit the general practitioner attends his patients on equal terms with the other members of the staff the specialist and the health worker and he can seek help both in the out patient department and if necessary in the homes of his patients. Such assistance may be obtained from the preventive and social services as well as from the staff and equipment of the hospital. In this way the general practitioner acts as a channel of communication in both directions between the hospital on the one hand and home care on the other so that the patient can be provided for according to his needs

## Services to patients

Many hospitals enjoy high prestige in the community because they set out to render kindly and thoughtful services to their patients. Others both large and small have not yet established this kind of human relationship but it is nevertheless part of health care. In the more simple forms of service one includes the provision of books, a good postal system, humane arrangements for visits by relatives and friends and the provision of accommodation for private interviews and for the relatives of patients who are dangerously ill. The service of appetizing food in an attractive way is no small part of the patient's comfort and may contribute considerably to his recovery.

More specifically the hospital often renders services which are in a real sense concerned with the promotion of health. Obstetric consultations for example in the course of pregnancy do a great deal to give the expectant mother confidence and at the same time present useful signals to the physician. The provision of general physical examinations at the time when a patient attends hospital for a particular condition may give great help towards ascertaining the origin and the prognosis of a disease. Similarly in the special study of conditions of the heart and the lungs as well as in general medicine it is useful to carry out systematic chest examinations and to keep track of any changes in the patient's condition by means of radiological examinations. In some countries the frequency of parasitic diseases and of special ailments associated with country or climate would amply justify systematic examination for the detection of malarial parasites and various other parasitic diseases which are common in such areas. Public education with regard to trachoma is another case in point.

In the hospital emergency service there are often opportunities for the exercise of preventive activities in some areas inoculation is practised and supplements to some extent the work of the local health department but on the whole it seems better that functions of this kind should normally be

performed by the patient's own doctor. Like the family doctor the staff of the out-patient department also have to keep a sharp look out for communicable diseases especially in paediatric work. During the past few years an increasing number of hospital out-patients have had the benefit of the services of psychiatrists and psychologists in the preliminary assessment of the part taken by nervous and mental disorders in the etiology of the conditions that bring them for consultation. Again the evaluation of the services rendered to patients by medical social workers demonstrates beyond doubt that they stand in high repute. In the first place the medical social worker is the closest link between the patient and the outside world including both the home and the job. Secondly she is the adviser on all problems connected with such matters as insurance contributions, pensions and other outside affairs which often worry a sick person far beyond the actual difficulties of the situation. And thirdly the medical social worker is usually the most important contact between the hospital service within the institution and any after-care or rehabilitation measures which may be provided following discharge.

## Records and research

Medical research is one of the aspects of the public health programme which receives most benefit from careful specialized organization. It is important that so far as possible overlapping of projects should be avoided and above all useless rivalry between one institution and another. Efforts must be made also through some central scientific body such as a medical research board to ensure that financial aid is reserved for those workers who demonstrate their capacity for the particular study which they wish to undertake. The theme of research should permeate the whole hospital organization because it is primarily by this means that advances are made in medical care.

In the hospital services research may be conveniently divided into the following categories

In one of the group discussions further functions for the out patient department were suggested as follows

(a) In rural areas especially out patient services have an important relation to the control of communicable diseases and maternity and child care. They can also contribute in the field of rehabilitation. While some countries have developed special rehabilitation centres it was felt that the general hospital and especially the out patient department should also assume responsibilities for helping patients adjust to their disabilities by maintaining contacts with the home. This function was mentioned especially with regard to the chronically ill and the aged.

(b) The group believed that out patient departments can render an important service by providing periodic examinations for chronic diseases and the early detection of tuberculosis cancer cardiovascular diseases etc. These tasks may not need to be assumed by hospitals if they have been developed by other community health services.

### The rural health unit

The concept of a rural health unit was fully discussed by an Expert Committee in a report published in June 1934<sup>1</sup>. In that Committee it was agreed that the rural health unit should be regarded as the nucleus of the rural health service in any area. It was defined particularly as "an organization providing or making accessible under the direct supervision of at least one physician the basic health services for a community. This type of unit is an essential feature of all medical care services where the smallest type of hospital is too remote or inaccessible for daily services to a given community. Its aim is to extend health and medical care services in such a way as to serve as an outpost of public health. Many of the less developed countries are faced with this problem of whether to establish a public health unit first concentrating on the

eradication of mass diseases or to begin with the provision of a hospital. Areas vary greatly but there is no doubt that in most circumstances the provision of an outpost so to speak would save the construction and maintenance of many hospitals. In a unit of this kind it is natural and proper to secure the complete integration of curative and preventive services. Some participants were ready to go further and to suggest that small units in urban areas also would serve the needs of general practitioners and at the same time provide a health service close to the homes of the people. It would be unfortunate if a sharp division were made between urban and rural services.

### Home care

The question of a home care service—especially nursing and midwifery—was touched on by several groups. The extent of this service must necessarily vary from country to country. In the economically less developed areas provision of a full home nursing service may not be possible because of a shortage of nursing staff. In some countries practically all the midwifery is undertaken in the hospitals while in others it is a domiciliary service with midwives who are for the most part untrained. Some groups thought that this type of service might well be brought together by the hospital authorities while others considered that hospitals under normal conditions could not undertake such action.

In some countries "home helps" are a part of the home care service.

Many groups gave full consideration to the position of the general practitioner in relation to home care and the smaller hospital units. It was widely felt that the general practitioner should be brought into the health service as fully as possible and that he should in fact be the keystone of its structure in the smaller units whether urban or rural. The general practitioner is the best guide to the needs of patients in relation to their families their homes and work places and their immediate environ-



The well conceived out patient department is in no sense antagonistic to the general practitioner and the home care he wishes to provide. On the contrary by its valuable diagnostic equipment such as X ray and laboratory services the out patient department can be of direct assistance to the general physician without bringing the patient into hospital. In addition valuable services can be given in relation to physiotherapy and by out patient clinics devoted to minor psychiatric disorders. It has been suggested that an out patient department might restrict the general practitioner's functions but where there is good collaboration between the two the whole facilities of the department including its laboratory services increase both the scope and the prestige of the general practitioner's work.

The more strictly preventive functions of a hospital out patient department were next discussed. It was emphasized that the service should reach the homes of the patients even in the more remote and inaccessible areas. This is especially true of pre-natal and infant care in which a team of experienced workers including doctor nurse and assistant can undertake services in villages and rural areas in co-operation with the doctor on the spot. Often enough the out patient department or one of its health clinics is in fact the nearest centre to the homes of the patients and it is from there that the doctor himself carries out his functions.

The value of an efficient record system has already been mentioned because it is through this means that one can get a true picture of morbidity and the epidemiology of sickness in a given area. The out patient department when it is fully developed is a most valuable record centre and should be the basis for essential field research in co-operation with the general practitioner.

It has been suggested that in order to economize in the number of hospital beds the promotion of home nursing facilities home helps and similar services might be organized or integrated with the out patient department. Much depends on the kind of

area and the accessibility of services. Where transport conditions are difficult it is no doubt wise to arrange for the hospital to undertake all these services itself on the team basis but in the larger towns and where transport is easy and cheap it is probably better to organize home nursing care home helps etc. through the public health department in close co-operation with the hospital.

Another service which has been specially mentioned is the nursing care of the new born and special hospital accommodation for the admission of children who fail to make satisfactory progress. The hospital can also serve as an admission and treatment centre for premature babies for the facilities which it can offer are always greater and more up to date than it is possible to provide in the home. Reference has been made to mental health and a further consideration of the out patient work is the employment of psychiatric social workers in the field to enable mental hospital patients to be discharged to home supervision at an early date.

As we have seen it is in the smaller out patient departments that it is easy and helpful to secure co-operation or even integration between the local health department the hospital and general practice. It has sometimes been felt that it would be a mistake to place the hospital in the centre of the picture when medical care programmes are being considered. This is no doubt true of the in patient accommodation of those who are sick. In the more modern concept of out patient care however there is a good deal to be said for a reorientation of services to transform the out patient department into a polyclinic. In other words in hospital organization there tends to be a shift of emphasis from hospital beds to out patient departments. The latter serve as a screening apparatus for all patients admitted and they are equally valuable in the study of patients discharged from bed care to advise the practitioner for example whether further attendance is necessary or on the kind of home treatment which might be continued in the interests of the patient.

teaching. A much more important feature is to encourage meetings of doctors and nurses in the out patient department with the public health personnel. This is the right meeting place for the team consisting of specialists, hospital medical officers, nurses and public health workers. In this teaching the out patient department should depend as far as possible on its own resources and should not have to look to outside agencies such as the local public health department for teaching material. Among the resources mentioned many of the ordinary out patient activities could be better developed for teaching purposes such as rehabilitation education in nutrition and dietary habits, the early detection of communicable diseases and the promotion of mental health including the preventive care of early and minor psychiatric disorders. The extent to which preventive activities are in fact carried out in the hospital is an excellent measure of the education which medical nursing and auxiliary staff receive. In many instances a conscious effort is needed in hospitals and especially out patient departments to develop a social and preventive attitude toward illness.

The whole matter of training in preventive activities was crystallized effectively by the chairman of one group. He pointed out that in many countries the separation of preventive from curative medicine persists in spite of the lip service that is paid to integration. "Physicians," he said, "are stubborn in this idea. Even health officers are reluctant to make contact with hospitals. People who receive services from physicians and health departments readily recognize this separation. There needs to be a re-education of hospital and health workers and the public to the effect that curative and preventive medicine cannot be separated. Yet even in well developed countries a hesitation prevails. Hospital administrators have doubts about taking on additional duties and responsibilities. Most of them are already burdened with heavy loads and feel that it would be difficult to develop preventive services as part of the hospital

programme." This group also felt that health officers should be closely linked with hospital administration and if possible become members of the hospital staff.

To sum up these teaching functions should apply to the training of physicians, nurses, social workers, laboratory technicians and other members of the health professions. The opinion was expressed that it was unwise to isolate the hospital from educational activities for health and that the actual services of the hospital were of outstanding educational value. Many of the special health sciences could best be developed in hospitals and post graduate education could be carried out within the hospital itself. In post basic education of nurses for special clinical fields carefully planned integration of theory and practice is essential. The hospital is of major importance in providing the practical experience. Indeed it was stated that among the more important factors which would limit or extend the value of the hospital to the profession and the community would be its stage of development in the matter of training personnel, especially with regard to the teaching of preventive medicine in medical schools.

#### **The patient and the public**

The hospital has many important contributions to make to the health education of the public. Maternal and child health is one of the preventive activities which can be developed in the hospital with the maximum efficiency and to the greatest advantage of the community. Pregnant women and mothers can be given basic health education and particularly teaching in the ordinary care of babies and young children. Health education methods can also be applied successfully to patients suffering from tuberculosis and other social diseases. Up to a point the same may be said of older people suffering from degenerative disorders such as cardiovascular diseases and early carcinoma.

In some countries mothers are allowed to stay with their children and give them simple

ment and any attempt to create a health service without his full co operation is bound to lose much of its potential value. In particular the general physician is in the

best position to deal with preventive and curative medicine at the same time and to give health education to the patients under his care and to their families.

## THE HOSPITAL AND EDUCATION IN HEALTH

While many of the groups felt that the hospital could be regarded as only one part of the public health and medical care services they were agreed that instruction in preventive medicine and the promotion of health was an essential hospital function. The aim of progress should be to secure a greater measure of co ordination of the three medical services—hospital, public health and general medical practice. This could only be brought about successfully by a reorientation of medical education.

### The medical student

In most medical schools the training of the undergraduate student is largely devoted to the basic sciences and in the later years to clinical medicine within the teaching hospital. It is still exceptional for students to receive any teaching of substance in preventive and social medicine either through regular clinical study of these aspects in the wards or through the medium of visits to health centres, schools, industrial institutions and families in their own homes. In many schools the teaching of public health as a subject of the curriculum tends to be perfunctory and to deal with the environmental side. It is only in recent years that a number of medical schools have assumed leadership by offering special courses of instruction in the prevention of sickness, the social aspects of medicine and the promotion of mental and physical health. It has often been urged that such teaching should permeate the whole medical course and no doubt this is the ideal arrangement. But it is far from being realized. In the meantime and doubtless for a long period of development it is

essential that undergraduate medical schools should have the services of an organized department whose function is to undertake training and research in preventive and social medicine.<sup>3</sup>

### Nurses

Just as the medical student in his undergraduate years should be presented with every aspect of prevention so the curriculum of a school of nursing should provide not only for a general education in the subject but also for greater teaching emphasis on preventive medicine and the promotion of health. Experience in health centres and in the homes of the people (under the supervision of public health nurses) should be part of the training. The nurse has an important role to play in family care and it is essential that she should be qualified to carry it out. In many countries a great deal of attention is being given to the integration of the preventive aspects in the nursing curricula. In this connexion special attention should be drawn to the report of the technical discussions for 1956 on the subject 'Nurses, their Education and their Role in Health Programmes'.<sup>4</sup>

### Other hospital personnel

Many of the participants urged that outpatient departments of hospitals—large or small—were especially appropriate for the training of hospital personnel in health work. This is not merely a question of formal

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of private or voluntary hospital services has been encouraged. In such cases it is suggested that hospitals should receive subsidies for the care of the poor and for certain other conditions such as the so-called "social" diseases. The main reason for this distinction is no doubt that in the remoter areas it is impossible for communities to meet the high costs of hospital construction and maintenance.

One of the discussion groups set out in its report a number of the limitations on the organization of a hospital system in the public health programme. Such limitations included (a) the economic and cultural development of the country (b) the political and administrative organization (c) the size of the country including the distribution and density of its population and the communications available (d) the traditional organization and background of public health and hospital services e.g. the existence of the voluntary system or the direct development of State control and (e) the stage of development reached by the country in the training of its own personnel especially with regard to the teaching of preventive medicine in medical schools.

### The regional system

A great majority of groups were in principle in favour of regional development of hospitals. They agreed that in that pattern the types of hospitals referred to in the section "The Hospital and its Functions" (see page 201) formed a satisfactory grouping. Under such conditions there should be a smooth flow of patients from one type of hospital to another without any administrative hindrances. Ideally the hospital region and the public health region should be geographically identical with both services placed under one and the same authority for effective co-ordination. In practice this would be extremely difficult in certain countries where the hospital system was widely developed before a public health service came into existence. In some countries for example many generations ago

small hospitals were built in various centres of population and have been up to the present time practically autonomous. To regroup them into a practical administrative system under a regional authority would be virtually impossible. In other countries however in which active development of services has recently taken place or is still under consideration the very fact that there are few established medical and public health services makes it feasible to apply from the outset the principle of regionalization.

It was generally agreed that the most valuable function of the regional system was to co-ordinate the hospitals and to promote local interest without attempting to achieve unification. In some cases it is no doubt desirable to have a common system for the purchase of stores and supplies and even within regions hospital groups can provide for laundry services. Ambulance services however while being carefully co-ordinated regionally should be based on individual hospitals.

To sum up the concept of hospital regionalization means the establishment of a close working relationship between several categories of hospitals. Among these were mentioned (a) the central hospital generally affiliated with a university and devoting considerable time to teaching (b) the intermediate hospital located in large centres of population but without university connections (c) the local community hospital of a more general character and (d) the rural health and hospital centre. This does not imply that the regional system is a hierarchy in which larger hospitals are in more or less direct control of the smaller. On the contrary while the central authority is in overall charge of the hospital system and the regional authority has many planning and advisory responsibilities each hospital within the region has its own pattern of service in accordance with the needs of its community. The object of the regional system is not to exercise meticulous day-to-day control but to co-ordinate the hospitals in order to secure from each the best service available. Regional development is essentially a decentralization

attention while they are patients in hospital. This is an admirable occasion for health education through the nursing service. During their stay in the hospital mothers can be taught how to care for their children during sickness and how to feed them correctly and make use of ordinary hospital routines including bandaging nursing care etc.

The mental health field is also full of promise. Hospital physicians can do much in this way by their own attitude to patients giving them simple and kindly instructions and above all treating them as persons rather than cases.

On the whole the out patient department of the hospital constitutes one of the most effective means by which we can promote health. The organization of these services differs very greatly between one country and another and there are also considerable variations in the number and size of services on account of such factors as accessibility, social well being, economic conditions and the number of medical practitioners and nurses available. In all areas and perhaps especially in the more remote ones, hospital services through out patient departments and small clinics can render a great service to public health.

## ORGANIZATION OF HOSPITALS

### GENERAL ADMINISTRATION

#### The central authority

In the older countries the hospitals grew up in response to some specific need such as the recognized association of poverty, age and sickness. From time immemorial the great source of hospital care has been a religious or philanthropic foundation. In the presence of disaster, however, such as a great plague, it has been necessary for hospitals to be specially organized by government or some power clothed with authority. The modern hospital system depends in many countries partly on government funds and partly on voluntary resources. On the whole the tendency is towards increasing government participation and financial responsibility. The system of financing hospitals varies enormously in the countries represented in the groups. In the majority the central government or some subordinate governmental authority is directly responsible for the establishment and maintenance of hospitals. Among the most notable exceptions is the United States of America where a large proportion of hospitals is provided by private enterprise either through associations of medical men or

insurance organizations or foundations of an industrial or other origin.

In most countries the State is the authority which licenses all hospitals, whether voluntary or governmental. In some areas there is a private organization. In the United States of America and Canada, for instance, this is known as the Joint Commission on Accreditation of Hospitals. This Commission is sponsored by five professional bodies in the two countries. It inspects hospitals and issues certificates of accreditation based on standards of staffing, qualifications of personnel, quality of equipment, etc. In the main, however, the central authority itself (e.g. the Ministry of Health) is responsible for the standards maintained in the hospitals throughout its area. The government must be responsible either directly or ultimately for certain hospital programmes, such as the control of communicable diseases, the provision of medical care for the needy, and also certain services to deal with mass health problems such as widespread nutritional disease. In the rural areas of the less developed communities the government usually assumes full responsibility for hospital services, but in populous areas the utilization

trator is a member while in others there is an almost complete separation of functions. In the larger hospitals which have no university teaching functions the administrative pattern is simpler and more regular. As a rule the medical administrator is secretary to the managing body and at the same time a member of the medical committee which deals with all professional matters. The essence of success lies in teamwork in which medical nursing catering and auxiliary services are brought together under a co-operative system of control preferably through an internal committee of which the medical administrator is chairman. In the smaller towns and urban areas it is less easy to justify the appointment of a whole time medical administrator. Some of the groups felt that administrative functions could well be combined with the duties of a health officer. In actual practice medical adminu

nistration of hospitals of this intermediate size is often undertaken by a member of the medical staff who has also clinical functions e.g. in radiology or some other specialty. This system may work satisfactorily provided that there is a junior medical administrator whose duties fit in with the general arrangement.

Lastly in very small and remote units of hospital care such as rural health centres administrative duties are often undertaken through the agency of the nearest intermediate hospital. For day-to-day duty it is often found convenient to have a senior nurse in charge or to have the centre under the general supervision of a local general medical practitioner. In such areas at any rate it is important that these centres should be co-ordinated under the skilled management of some combined hospital and health centre and not left in isolation.

## PROBLEMS OF CONSTRUCTION

On the question of construction of hospitals there was relatively little discussion. It was generally agreed that design was a local problem depending on materials available and on the type of construction prevalent in the particular district. In highly populous areas in cities the cost of the site was a major factor and it was generally necessary to build hospitals of many storeys. Central units in populous areas would always be necessary especially for emergency and out-patient work. On the question of siting however several discussions brought out the view that the larger hospitals might well be built on the outskirts of populous areas. The factors which governed the choice included the need to avoid excessive noise the availability of land and its cost, and above all the amenities which would surround the building. In hospital construction it is of great importance that medical and nursing staff should be consulted with regard to the architectural plans. This is especially urgent in connexion with nursing in order to avoid

the excessive waste of time and effort on the part of the nursing staff in what is called travel time while at the same time giving full consideration to the comfort of the patients.

With special regard to planning several groups urged that construction projects should be drawn up by a technical expert on the site and that in public health municipalities there should be a functional group of doctors architects and engineers who would study every scheme put forward. In the view of one group the hospital section could be readily built in several storeys but the technical services should be so organized as to permit of some flexibility and provision for ultimate expansion.

In the less developed areas it is both convenient and economical to secure the construction of standardized units and to have special regard to mobility that is the ready transport of standardized sections. This is of particular importance in countries and areas where communications are difficult and roads unsatisfactory.

with the ultimate object of bringing each hospital into a closer relationship with the community it serves. It is of great importance that hospitals should not be isolated from the realities of social, economic and cultural features which characterize its community.

A regional and decentralized system of hospital service also provides a greater fluidity in the use of personnel. In other words, a physician or other health worker can be transferred readily from one category of institution to another. By this means it is possible to concentrate medical and nursing forces where they are immediately required, for example, in the case of an emergency or a serious disaster. A second advantage is that the health worker secures a greater

variety of work than when he is confined all his working life to a particular hospital. In addition to this, the regional system has certain advantages with respect to the ready adjustments which can be made when unexpected changes in the picture of health and sickness impose strains on the hospital services. A striking example of this is the rapidly changing importance of tuberculosis in many countries compared with the position of a decade or two ago. In a regional system it is felt that a particular institution can be more easily adapted to some new social requirement. Such changes are exceedingly difficult where there is no coordination or affiliation in the hospital services.

## INTERNAL ADMINISTRATION

### The administrator

The administration of individual hospitals varies in different countries, but there is no doubt that the majority of the groups favoured the system by which hospitals are in charge of medically qualified administrators. In most cases these hospitals also have administrative officers acting as deputies to relieve the medical administrator of most of the responsibility for purely financial, business and domestic matters. In a number of countries, however, non-medical administrators are widely used and in many cases they are highly trained in hospital administration. Generally speaking, however, most of the groups felt that a medically qualified administrator was preferable because he is in a better position to understand and assess the relative importance of the requirements from members of the medical staff in charge of different branches of the hospital. He is also in a better position than a non-medical officer to maintain satisfactory relations with the medical heads of departments and further—a most important point—to encourage the development of preventive medical work in association with the hospital service as a whole.

Some of the groups gave special attention to the administrative problems of the smaller hospitals. In some cases it would be both possible and desirable to appoint the local health officer as medical director of one or more smaller units, while in others it might be more convenient to appoint a medical administrator in charge of a group of units serving a considerable area. In some countries a course of training of university standard has been designed for medical or non-medical persons entering the sphere of hospital administration. This is a valuable advance and the formal course ought in every case to be supplemented by in-service training.

### Problems of special areas

In the large cities associated with university centres the teaching hospital presents difficulties of its own. The needs of medical and nursing education have to be met within the same administrative system as hospital management and the care of patients. In some areas this difficulty is surmounted by the appointment of a special educational committee of which the medical adminis-

trator is a member while in others there is an almost complete separation of functions. In the larger hospitals which have no university teaching functions the administrative pattern is simpler and more regular. As a rule the medical administrator is secretary to the managing body and at the same time a member of the medical committee which deals with all professional matters. The essence of success lies in teamwork in which medical nursing catering and auxiliary services are brought together under a co-operative system of control preferably through an internal committee of which the medical administrator is chairman. In the smaller towns and urban areas it is less easy to justify the appointment of a whole time medical administrator. Some of the groups felt that administrative functions could well be combined with the duties of a health officer. In actual practice medical adminu

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## NOTES ON FINANCING

All the discussion groups gave some attention to the problems of financing hospital services and the increasing costs of hospital care. As might be expected the great variety of countries and groups represented brought out many different patterns of financial control. In some instances the central government was responsible for the entire provision of hospital and health services but a number of groups felt that this might tend to interfere with originality and produce a somewhat dull and mediocre uniformity. One group indicated that it did not support any compulsory system of health insurance believing that all people should pay for some part of the services received whether in the hospital or through its out patient department. It was suggested that the assumption by a third party of the full cost of insurance whether compulsory or voluntary might well prove to be too expensive. Nevertheless all groups recognized that under modern conditions governments had some responsibility in making financial provision for hospital care even though it were only for the indigent. The essential feature of all hospital care nevertheless rests on this assumption that there should be no financial bar between the patient and the medical attention he needs at the moment of sickness, accident or other emergency.

One final matter was emphasized in relation to finance—the danger that curative

services which are by the nature of things much more costly than preventive tended to swallow up the funds available for public health work. It is usually easier to obtain funds for curative work. Apart from the greater willingness of governments to allocate such funds it is notorious that voluntary contributions are far more easily obtained for such purposes. Voluntary funds are in fact rarely available for preventive purposes and the promotion of health.

The question was raised whether WHO might draw up suggestions for guidance applicable to the various types of hospitals in different parts of the world with regard to financing construction and operation of hospitals. In this connexion the group noted with satisfaction point 8(2)\* of the first report of the WHO Expert Committee on Medical Care according to which the future work of the Committee would include the framing of plans and organization of hospitals of all kinds.

In the closing discussion at the plenary session it was suggested that the hospital problem was so great and so diffuse that the study of the role of the hospital in the public health programme should not be confined to the present technical discussions and should be continued in the manner considered by WHO to be most appropriate.

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## FIVE YEARS OF YAWS ERADICATION IN HAITI\*

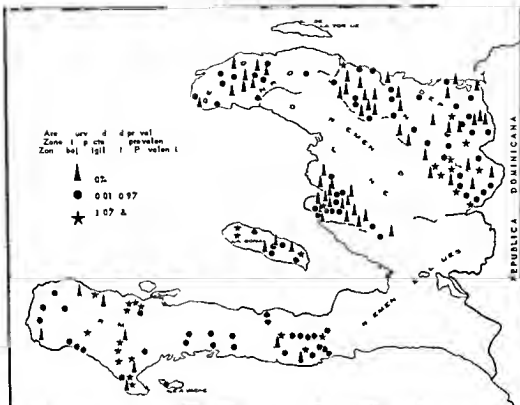
As a result of the campaign against yaws in Haiti which began in July 1950 the prevalence of symptomatic yaws among the rural population has been reduced to approximately 0.5%. Attention had been drawn

to the high prevalence of this disease in Haiti prior to the starting of the campaign by United Nations experts and other investigators as well.

The campaign has been conducted jointly by the Government the Pan American Sanitary Bureau (WHO Regional Office for the Americas) and UNICEF with the primary aim of eradicating yaws by mass

Summary of an article by Dr E. Petrus D.ecto, Administrator of the Yaw Eradication Service in Haiti, the Director of the Yaw Eradication Clinic, and the Director of the Yaw Eradication Clinic, Haiti, who happened to be in Haiti at the time of the Yaw Eradication Service in July 1957.

# PREVALENCE OF ACTIVE YAWS IN HAITI (DECEMBER 1955)



penicillin treatment a secondary aim has been to eliminate rural syphilis by therapy of infectious cases

It is clear that to eradicate yaws both the infectious and the potentially infectious cases have to be given adequate treatment and that the treatment used has to be easy to apply to large numbers of persons in the shortest possible time and with the minimum risk entailed. For this purpose procaine penicillin G in oil with 2% aluminum monostearate (PAM) was chosen. 600 000 units being given to cases and 300 000 to contacts. Any person with symptoms suspected to be those of yaws was classified as a case and symptomless persons in some relation with the cases were considered contacts.

Operations started in the Southern Department under a "daily clinics" system whereby the population of an area to be treated was notified of the place and date chosen for examination and treatment. Between 20 July and 27 October 1950 666 738 persons were treated or according to the census returns only slightly over 60% of the population of this Department.

## Success of house treatment method

It was then decided to adopt a method which would ensure much fuller coverage of the population. This was achieved by treatment teams making house-to-house visits throughout the country. Yaws cases were

given 600 000 units of PAM and the remainder of the household in which a yaws case was found was given contact treatment. By the end of December 1954 97.2% (2 834 712 persons) of the rural population of Haiti had been treated by this method. 32.5% of these as cases and 67.5% as contacts. Adding the number who had received injections under the daily clinics method, the total number of persons treated came to over 3½ million.

A number of resurveys made in various parts of the country in order to evaluate the results obtained showed the prevalence to have dropped to such an extent that by January 1955 the home treatment method could be replaced by one based on the early discovery and treatment of yaws cases and the treatment as contacts of other members of the household and of the four nearest houses. When symptomatic yaws was dis-

covered in a schoolchild all other pupils were treated as contacts.

To apply this method the country was divided into five zones, 10 subzones and 78 districts. In each district an inspector with previous training in yaws diagnosis and in epidemiological work was appointed to be permanently responsible for the district. In the first five months of 1955 2087 cases of yaws and 13 007 contacts (approximately six for every case) were treated throughout the 78 districts.

Although by the end of May 1955 the major stages of the campaign had been completed the work which has been carried out in the various districts for the discovery and treatment of yaws cases and their contacts as well as health education is being continued by the district inspectors under strict medical and administrative supervision.

## Epidemiological and Statistical Information

### WORLD INCIDENCE OF POLIOMYELITIS (1950-55)

Of the various virus diseases poliomyelitis is probably the one which attracts most attention and in connexion with which the most active research has been carried out. The disease is present everywhere and each year attacks a considerable number of persons. The serious sequelae it leaves behind even more than the large number of deaths it causes make poliomyelitis a particularly pressing public health problem.

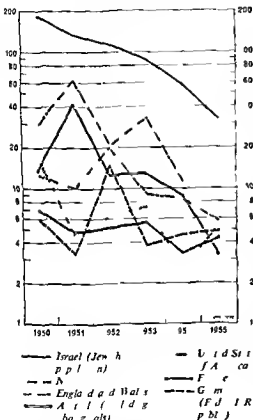
A recent number of the WHO *Epidemiological and Vital Statistics Report* deals with the annual incidence of poliomyelitis for the period 1950-1955 in 61 countries.<sup>1</sup> The statistical information contained in the Report raises the question of the difficulties encountered in assessing poliomyelitis morbidity and

mortality. In practice the number of cases of poliomyelitis notified to health authorities often represents only a fraction of the real total. This is also true of other notifiable diseases but the discrepancy is more marked with poliomyelitis as a considerable proportion of non-paralytic cases—which can vary from country to country according to whether or not an epidemic is present—may escape notice. Furthermore it is very probable that many more cases are notified in such countries as the United States of America and the United Kingdom where on account of the marked increase in incidence of the disease during recent years the detection of cases is becoming more and more thorough. There are however other factors which affect the comparability of morbidity and mortality statistics as between countries and even as between different regions of the same

<sup>1</sup> *Epidemiol. vi t. Stat. R. p.* 1957 10 115 146 (No. 3)  
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country such as the number of physicians in ratio to the population and the rural or urban "primitive" or "developed" nature of certain regions

WORLD INCIDENCE OF POLIOMYELITIS  
IN SEVEN COUNTRIES  
1950-1955



It is then quite understandable that as notifications of cases of poliomyelitis are most complete for North America and Europe comparison of data can only have some significance as between these two continents

However in spite of the reservations and gaps the statistical information provided in the Report is interesting as it underlines the

changes in the incidence of the disease from one year to another and gives some general idea of the situation in the countries studied. It also makes it possible to obtain a picture of the international aspects of this problem.

The analysis which follows is necessarily condensed and limited to the more significant aspects of incidence of the disease in the period 1950-1955 in the various continents

## Africa

Numerically speaking notifications for the continent of Africa as a whole are relatively few. Nevertheless during the period under consideration there was a marked increase in the numbers of cases and deaths registered in the various African countries and territories. This was particularly so in French West Africa (385 cases in 1954 and 117 in 1955 as against 11 in 1950) in Angola (764 cases with 60 deaths in 1951 and 270 cases with 10 deaths in 1955 as against 9 cases in 1950) and in the Belgian Congo (750 cases with 43 deaths in 1954 and 1216 cases with 48 deaths in 1955 as against 337 cases with 19 deaths in 1950). In fact morbidity and mortality from poliomyelitis in the Belgian Congo has increased every year since 1950. A similar tendency—somewhat less marked—has been noted in Egypt, Kenya, Southern Rhodesia and Tanganyika. In the Union of South Africa 856 cases with 40 deaths were notified in 1954 as against 161 cases with 12 deaths in 1950.

## America

Although information is lacking or is very incomplete for a number of countries and territories in the two Americas for certain others notifications were particularly numerous during the period under review. In Canada for example 8888 cases with 481 deaths were notified in 1953. In the United States of America 57 879 cases and 3145 deaths were registered in 1952 that is twice as many as in 1951 (28 386 cases and 1551 deaths) and more than during any year since the disease became notifiable. The

given 600 000 units of PAM and the remainder of the household in which a yaws case was found was given contact treatment. By the end of December 1954 97.2% (2 834 712 persons) of the rural population of Haiti had been treated by this method. 32.5% of these as cases and 67.5% as contacts. Adding the number who had received injections under the daily clinics method the total number of persons treated came to over 3½ million.

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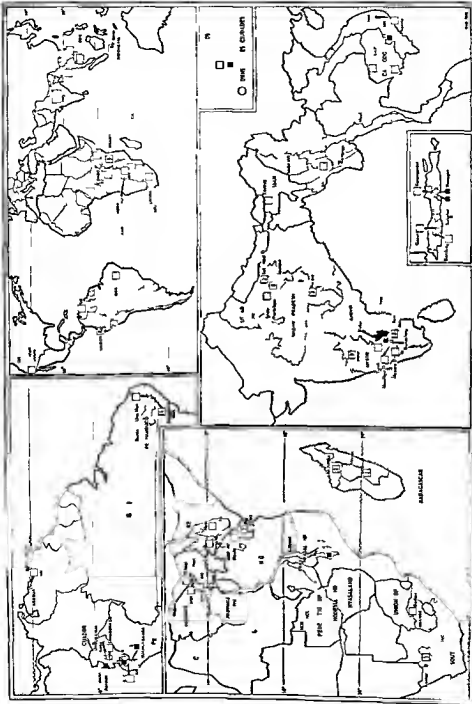
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<sup>1</sup> *Epidemiol. Infect.* 1956, 51, 1-10. (No. 3)  
This number contains tables relating to mortality and morbidity from poliomyelitis in 61 countries for the years 1950-1955. The tables are arranged in two parts: the first part gives the number of cases notified to health authorities and the second part gives the number of deaths.

# PLAGUE IN 1956



United States mortality rate (per million inhabitants) reached 20.2 in 1952 it fell to 5.7 (provisional figure) in 1955. In Canada the two extremes were 32.6 in 1953 and 2.3 in 1955.

In 1953 important outbreaks were noted in Argentina and Brazil in 1950 in Chile in 1951 1953 and 1955 in Mexico and in 1955 in Peru Puerto Rico and Uruguay.

### Asia

Information available for 10 Asian countries and territories is too fragmentary and incomplete to permit any valid conclusions to be drawn. In general however it may be said that incidence of poliomyelitis in Asia and the Middle East has varied considerably from country to country. The situation with regard to Israel is particularly interesting before 1950 widespread epidemics of poliomyelitis were unknown but in that year 1604 cases and 202 deaths were registered. In the following years the figures gradually fell until in 1955 there were only 479 cases with 51 deaths.

### Europe

In the 23 European countries and territories for which information is available there were important epidemic outbreaks during the period. Although the number of cases notified was lower than in the United States—whose population is only half that of the European countries in question—mortality was much higher. For all 23 countries

notifications numbered 15 708 with 1459 deaths in 1951 and 30 818 cases (record figure for Europe) with 2275 deaths in 1952. In 1950 the countries most affected were Norway with a mortality rate of 30.3 per million inhabitants and Sweden with a mortality rate of 22.4. The least affected country was Belgium with a rate of 2.8. In 1951 Norway still headed the list with a rate of 62.8 followed by Switzerland (18.3). Denmark had the lowest rate in that year (0.2). In 1952 on the other hand the rate in Denmark reached 60.7 while Scotland was the least affected (2.3). In 1953 Norway once again had the highest rate (32.4) and the Netherlands had the lowest (0.8). In 1954 the highest was Switzerland (22.7) while the Netherlands kept its place at the bottom (0.3). The statistical data for 1955 with respect to certain countries are still not available.

### Oceania

Statistics are shown in the Report for three countries and territories—Australia, Hawaii and New Zealand. For these three the year 1951 marked a considerable increase in the numbers of cases (4779) and deaths (348) as compared with the other years under study. The figures for 1955 were 1995 cases with 64 deaths.

In conclusion it should be noted that mortality from poliomyelitis is definitely higher among males than among females in the 61 countries studied.

## PLAGUE IN 1956

Although plague is receding throughout the world it still persists in an endemic state in certain areas. According to information contained in a recent issue of the *WHO Weekly Epidemiological Record* (No. 19, 1957) there were fewer than 700 cases of human plague officially notified during 1956 as against about 1250 cases in 1955 and 1900 in 1954. The 1956 decrease was due primarily to a further fall in the incidence of the disease in India and to the small number of cases recorded in Burma and Indonesia. As will be seen from the accompanying maps the other principal foci of the disease are in Central Africa, the northern parts of South America and Viet Nam.

# GUIDE FOR SPECIFIC POST EXPOSURE TREATMENT

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# Reports of Expert Groups

## RABIES

During the third session of the Expert Committee on Rabies attention was focused on the progress made in the field of rabies since the previous meeting in 1953<sup>1</sup>

In the Committee's third report<sup>2</sup> the problems of diagnosis treatment of man and rabies control in animals are again dealt with and the question of antirabies serum and vaccine once more comes under discussion. A recent finding<sup>3</sup> has enabled the Committee to establish the value of serum and vaccine treatment. Until 1954 when an opportunity arose in Iran to study the effects of combined treatment on some 30 persons the number of cases had been too few to give a significant demonstration of the efficacy of this method. The results of other practical tests and of laboratory studies are now available as further proof.

In accordance with its usual practice the Committee took the latest experimental results as a basis for revising the recommendations it had previously formulated for the specific treatment of rabies after exposure to infection. A tabulated guide indicating what measures should be taken in the event of a bite by an animal presumed to be rabid is included in the report and will be of the greatest practical value to sanitarians and physicians. This guide which is repro-

duced in the present article together with some explanatory notes represents a slight revision of guides published in previous reports of the Expert Committee.

The Committee's report also contains the results of experimental studies on the immunization of animals against rabies and recommendations for rabies control in animals. The measures to be applied to dogs and cats coming from countries known to be infected have already been mentioned in these columns<sup>4</sup>.

The Committee especially emphasized the importance of rabies control in wildlife and pointed out that the rabies virus had recently been isolated from insectivorous bats. Although there is no direct evidence of natural transmission of rabies from insectivorous bats to man or to lower animals the possibility must not be overlooked as there have been many instances in which proven rabid bats have bitten human beings. Vampire bats in Latin America are frequent transmitters of rabies to man and animals.

Finally the Committee considered that potency tests for vaccines should be more standardized and be brought into general use. Such tests would make it possible to ascertain the presence and duration of antigenicity and would help to determine the stability of the vaccine. The acceptable potency and therapeutic dosage of the serum have been carefully defined and stipulated in the Committee's third report.

For an account of the work of the secretaries see  
Ch. O. Wild Hlth. Org. 1954 8 139  
Wild Hlth. Org. t. h. R. p. S. 1957 121 32 p. ges.  
Price 1/9 \$0.30 Swf. 1.— Publ. h. d. in Engl. h. Fren. h.  
and Span. h.  
See Ch. O. Wild Hlth. Org. 1955 9 308

See Ch. O. Wild Hlth. Org. 1957 11 49

# GUIDE FOR SPECIFIC POST EXPOSURE TREATMENT

Initial exposure	Status of biological agent		Recommended treatment (if indicated)
	At time of exposure	On day of exposure	
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The promotion of health is no longer concerned only with the control of pathogenic dangers but also with the maintenance of the physical mental and social well being of all members of society. Hitherto the role of the hospital has been restricted to the treatment of diseases and injuries but the time has come to widen its scope. The Expert Committee on Organization of Medical Care considers in a recently published report<sup>1</sup> how the hospital can provide the population with complete health care both curative and preventive and also be a centre for the training of health workers and for bio social research.

The hospital must not be an isolated institution it must fit into the general health programme and seek to gain the full support of the population by every available means.

It is by regionalizing the hospital system i.e. by establishing around central hospitals a network of intermediate and local hospitals and health centres that hospital resources can best be adapted to the needs of the

community. Every general hospital should have a sizable out patient department providing consultation services and home medical care through which it can reach out to the family unit. The concepts of day hospital and night hostel have recently been introduced. At the day hospital patients can receive the necessary treatment and return home in the evening. The night hostel receives patients who are able to work during the day but whose home conditions might aggravate their illness or make treatment impossible.

With regard to administration the Committee considered it preferable for a physician to be in charge of a hospital. Nurses and medico social workers will be called upon to perform an increasingly important role in hospital teams while general practitioners and public health officers must also play their part in hospital activities.

In brief the general hospital should be so planned as to provide medico social institutions public health administrations and individual practitioners with material support and with a means of achieving over all co-ordination.

## BIOLOGICAL STANDARDIZATION

At its tenth session<sup>1</sup> the Expert Committee on Biological Standardization authorized the establishment of international standards as well as the assignment of international units for the following substances: (1) pertussis vaccine (2) diphtheria antitoxin for flocculation test (fourth standard) (3) gas gangrene antitoxin (*vibrio septique*) (third standard) (4) streptomycin (second standard) (5) tetracycline (6) erythromycin (7) oxytocic vasopressor and antidiuretic substances (third standard previously called posterior pituitary lobe) (8) prolactin (second standard)

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The Committee decided that there should no longer be international standards for provitamin A, vitamin B<sub>1</sub>, vitamin C and vitamin E and offered the remaining stocks of these materials together with those of some other substances for which the standards had already been discarded to the Expert Committee on the International Pharmacopoeia for inclusion in the Collection of Authentic Chemical Substances held at Stockholm. It was also decided that the

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international standard for staphylococcus  $\beta$  antitoxin would not be replaced and that its routine distribution would be discontinued.

Among other substances mentioned in the report on which work is in progress towards the establishment of international standards or reference preparations are typhoid, rabies, smallpox and swine erysipelas vaccines, antivenins, antistreptolysin O, blood typing sera, poliomyelitis sera, typhoid and paratyphoid agglutinating sera, syphilitic

human serum, neomycin, phenoxymethylpenicillin, procaine benzylpenicillin in oil with aluminum monostearate (PAM) and pyrogens.

An annex to the report contains an up-to-date list of the existing international biological standards and reference preparations giving particulars on date of establishment, unitage and form in which the standard is dispensed, as well as numerous bibliographical references.

## Health Legislation

### DIPHTHERIA IMMUNIZATION: EXISTING LEGISLATION SURVEYED

In order to prevent any further outbreaks of diphtheria, one of the essential tasks of the health services is to ensure that as many people as possible are immunized. In the United States of America and in Great Britain, for example, it is estimated that in order to check diphtheria at least 70% of the child population must be immunized.

However, even when immunization is accepted in principle, the methods used to put it into practice in countries where endemic diphtheria exists are not uniform. While certain countries have decided that it is best to make immunization compulsory, others believe that health education of the public is sufficient.

The health services responsible for diphtheria immunization programmes are faced with other difficulties for to the well-established diphtheria and smallpox immunizations there have been added in recent years immunizations against tuberculosis, tetanus, whooping-cough, typhoid, paratyphoid, etc. and still more recently poliomyelitis vaccination. Immunization against some of these infectious diseases has moreover been made compulsory in several countries. While the use of combined vaccines (diphtheria, tetanus, whooping-cough, etc.) facilitates the carrying out of immunization programmes against

certain communicable diseases, decisions as to the types of vaccine that may be associated, and the age at which such vaccines should be administered, raise further problems.

A survey that has just been published in the *International Digest of Health Legislation*<sup>1</sup> reviews the measures provided for in some twenty countries where diphtheria immunization is compulsory. Where deemed apposite, account has also been taken of the recommendations made by WHO Expert Committees and the views of certain specialists with regard to various aspects of diphtheria immunization.

Compulsory diphtheria immunization was first introduced in the year 1932 by the Canton of Geneva, Switzerland. Between that date and the outbreak of the Second World War, about ten countries followed suit. In certain other countries where immunization had not been made compulsory, a considerable number of children were nevertheless immunized as a result of publicity campaigns. Since 1940, more countries have enacted diphtheria immunization legislation so that at the present time it is compulsory in about 20 countries.

However, it should be noted that in certain

<sup>1</sup> See *J. of Hyg. Leg.* 1957, 8, 171. This survey has also been published as a pamphlet (price 1s 9d, 30 Sw.fr 1.-).

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Yellow Fever Vaccine (first report) Occupational Health (third report of the Joint ILO/WHO Committee) Mental Health (fifth report) Health Statistics (fifth report)<sup>1</sup> The Board also noted the reports of the following WHO Study Groups: International Standards of Drinking Water Quality Use of Specifications for Pharmaceutical Preparations Treatment and Care of Drug Addicts and International Protection Against Malaria

With regard to the date and place of the Tenth Anniversary Commemorative Session and the Eleventh World Health Assembly the Executive Board authorized the Director General Dr M G Candau to negotiate with the Government of the United States of America (which has extended an invitation for these to be held in the United States) to communicate the agreement reached to the members of the Board and to report on the matter at the next session of the Board.

Among the other resolutions adopted at the twentieth session were those determining the composition of the Board's various committees. One of these—the Standing Committee on Administration and Finance—will meet immediately before the next session of the Board to examine the Director General's proposed programme and budget for 1959.

It was decided that the next session of the Executive Board would be held in the Palais des Nations, Geneva, on 14 January 1958.

#### Venezuelan donation for malaria eradication

The Government of Venezuela has recently contributed 1 000 000 bolivars (approximately \$300 000) to the Malaria Eradication Fund of the Pan American Sanitary Organization. The money was handed over by the President of Venezuela to the Director of the Pan American Sanitary Bureau which acts as WHO Regional Office for the Americas at a special ceremony in Caracas.

Venezuela—a country which receives technical assistance from WHO in the develop-

ment and co-ordination of its rural health services—has made considerable progress towards the eradication of malaria. The disease has now been eliminated from an area of 134 750 square miles where more than 80% of the total population of the country is concentrated. Mortality from malaria in Venezuela has been reduced from 110 per hundred thousand of the population in 1941-45 to 8.5 per hundred thousand in 1950 and latterly to 0.3 per hundred thousand in 1955. The Government of Venezuela has at present the largest national anti malaria budget in the Americas and it is planning to extend the eradication programme to the remaining foci.

#### Installation of the Regional Office for Europe in Copenhagen

At a ceremony which took place in Copenhagen on 15 June 1957 a new building erected by the Danish Government was formally placed at the disposal of the World Health Organization for use as its Regional Office for Europe. At the handing over ceremony Mr H C Hansen the Danish Prime Minister and Minister for Foreign Affairs and Dr Johannes Frandsen Director General of the National Health Service represented the Danish Government. The World Health Organization was represented by its Director General Dr M G Candau and the Regional Director for Europe Dr Paul J J van de Calseyde.

The WHO Regional Office for Europe will henceforward be permanently established in Copenhagen where it will continue the work previously carried out by it while located provisionally in Geneva.

#### Decentralization in WHO

Physical distance always creates organizational problems. Many additional administrations and commercial enterprises have accepted the solution of delegated responsibility in certain aspects of their affairs and international administration does not differ

<sup>1</sup> These reports will be published later in the *World Health Organization Technical Reports Series*.

of these countries systematic immunization is not compulsory. In some it is compulsory only for certain groups of the population or when there is risk of an epidemic or when the health authorities deem it necessary.

The age prescribed for immunization varies. In some countries it is six months, in others between six and twelve months, and in others again it is required as a condition for entry to school. Some experts recommend early immunization during the third or fourth month of life.

Although it is necessary to sustain the immunity acquired by means of reinforcing doses, many countries where primary immunization is compulsory make no provision for the administration of reinforcing doses. In others on the other hand one or two and sometimes more reinforcing doses are prescribed.

Combined immunizations were first prescribed in France in 1936. Few countries stipulate that combined vaccines must be used in Canada and in the United States of America, however, diphtheria immunization is rarely given alone but is almost always associated with immunization against tetanus and/or whooping cough. Certain population groups which are especially

exposed to the risk of infection may be required to be immunized against diphtheria and sometimes against tetanus and typhoid paratyphoid as well. This is the case in France and in Yugoslavia and applies especially to nursing personnel.

In certain countries immunization programmes are only put into effect when an epidemic occurs or an endemic shows signs of spreading. In countries where immunization is compulsory persons who have already been immunized may be required to receive a reinforcing dose whenever there is a risk. There are many causes for exemption from and contra-indications to diphtheria immunization and these vary considerably from country to country.

The subject matter of this survey is dealt with under the following headings: introduction, historical review, diphtheria immunization laws, compulsory immunization (age for primary immunization and for reinforcing doses, combining immunizations, emergency immunization, immunization and occupation), causes for exemption and contra-indications, organization of immunization programmes, miscellaneous (health education, vaccines, immunization technique), conclusion, references.

## *Notes and News*

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### **WHO Executive Board Twentieth Session**

The Executive Board of the World Health Organization held its twentieth session at the Palais des Nations, Geneva, on 27 and 28 May 1957. At its opening meeting the Board unanimously elected Sir John Charles, Chief Medical Officer, Ministry of Health, London, to succeed Professor G. A. Canaperia as Chairman. Dr P. E. Moore, Director, Indian and Northern Health Services, Department of National Health and Welfare, Ottawa, and Dr Dia El Chatti, Director of International Health Affairs, Ministry of Health and Social Insurance,

Damascus, were elected Vice Chairmen, while Dr A. da Silva Travassos, Director General of Health, Ministry of the Interior, Lisbon, and Dr Hafez Amin, Under Secretary of State, Ministry of Public Health, Cairo, were chosen as Rapporteurs. This session of the Board was attended by six new members designated in accordance with a decision taken by the Tenth World Health Assembly by the following countries: Afghanistan, Australia, Egypt, Germany (Federal Republic), Liberia, and the United States of America.

The Board authorized publication of the reports of four WHO Expert Committees

izations may make scientific contributions to this work

Dr Harold L. Stewart of the United States National Cancer Institute is acting as WHO consultant for the meeting after taking part in earlier preparatory work in association with the WHO Secretariat. The following experts are to form this group: Dr J. Higginson (Union of South Africa), Dr J. Knowelden (United Kingdom), Professor L. Kreyberg (Norway), Professor J. Maisin (Belgium), Professor Ch. Oberling (France), Professor Robert Scarff (United Kingdom), Dr Humberto Torloni (Brazil), Colonel F. E. Townsend (United States of America) and Dr Prem Wahi (India).

In June 1955 the Director General of WHO called together a small group of consultants to advise him on possible lines of development of the WHO cancer programme. The consultants made a number of recommendations, one of which was that special laboratories should be asked to hold reference collections of pathological material and sections from the cancers in which they are especially competent to be made available to other institutions on request. This new approach received a further stimulus in the WHO Executive Board at its seventeenth session in January 1956. One of its members, Dr F. J. Brady, anxious to encourage further study of unusual distributions of various diseases as a means of uncovering clues to their etiology, proposed that WHO should arrange for centres to collect tissue samples and to have these examined by competent pathologists.

This proposal was favourably received by the Board and the calling together of the Oslo study group is an important example of WHO's subsequent extension of its activities on cancer along the lines advocated.

## People and Places

### WHO AREA REPRESENTATIVE IN BURMA

Dr T. C. Puri, retiring Deputy Director-General of Health Services Government of India, has been appointed WHO Area Representative in Burma.

### European Conference on Health Education of the Public

A European Conference on Health Education of the Public is to be held in Wiesbaden, Germany, from 27 June to 5 July 1957, under the auspices of WHO and the Federal Government of Germany, together with the Land Hesse authorities. National planning meetings have already taken place in a number of the countries to be represented in preparation for the work of the Conference.

The aim of health work has gradually evolved over the years from the overriding preoccupation with curative aspects to the point where positive action for the prevention of disease holds an equal place. All health workers everywhere—doctors, dentists, nurses, sanitarians, etc.—are now held to have a duty to teach the people how to improve health and how to stay well as part of their function. In introducing new health measures, the administrator nowadays relies more on the education of his public than on legal compulsion, as a surer means of securing more than the mere passive compliance the latter may elicit or of overcoming possible hostility.

The main subject for consideration by the Conference is "How should the health worker learn to become a good health teacher?" It will also discuss the training needs in health education of physicians, nurses and other health workers at the different stages of training.

The following countries are participating: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and Yugoslavia.

In this capacity Dr Puri will maintain contact between the Government of Burma and the WHO Regional Office in New Delhi so that WHO assistance to Burma's health programmes can be effectively implemented and developed.

At present WHO-assisted programmes in Burma include tuberculosis control and training of tech-



fundamentally from any other Mr R Berkov whose study on decentralized international administration was recently published<sup>1</sup> considers however that the recent growth in number and complexity of intergovernmental institutions demands an examination of the administrative machinery they employ There have been a number of general studies on the characteristics of international administration—as for example that of E Wertheimer<sup>2</sup> and various articles in American British and French specialized periodicals Several historical treatments of international health organizations have also been published and the Constitution of WHO has been the subject of one juridical study—by J Crabol<sup>3</sup> a French physician Mr Berkov has chosen WHO for his thesis because it has not as yet been extensively studied and because its organization differs somewhat from that of other UN Agencies He reviews its history and development and attempts to assess the value of its administrative policy

John Stuart Mills proposition The authority which is most conversant with principles should be supreme over principles while that which is most competent in details should have the details left to it may perhaps be recognized in the regionalization policy of WHO Mr Berkov traces the early development of this move towards decentralization which had its origin in the constitutional provision for six regional organizations and suggests reasons which may lie behind it He then outlines the machinery of regional administration discusses the allocation of responsibility as between the centre and the periphery of the Organization and indicates some of the problems which generally accompany a policy of decentralization He points out that this policy affects of course only a part of the extensive operations of WHO Such projects as the epidemiological information services the

continuous collation of health statistics the extension of internationally agreed sanitary regulations the establishment of biological standards the publication of an International Pharmacopoeia the collaboration in research of international importance—these can best be undertaken by the central secretariat The efficiency of the Organization is thus assisted by its policy of decentralizing only where this best answers the case As the Director General stated in 1951 “Increased decentralization has brought the Organization into closer touch with the most immediate needs of Member countries and has enabled WHO to begin to assist each country in taking the next appropriate step towards developing its public health services within the limits of its economic social and cultural circumstances”<sup>4</sup>

Mr Berkov's detailed examination of WHO's administrative policies raises questions of considerable interest to students of international administration it may also be of use to a more general public in presenting an up to date picture of the worldwide activities of WHO and the lines along which the Organization itself has developed over the past ten years

### Study Group on Histological Definitions of Cancer Types

WHO is this month convening a Study Group on Histological Definitions of Cancer Types in Oslo (24 to 28 June) for the purpose of reviewing the present situation and of advising on how the work going on in this domain in various parts of the world may best be extended and co-ordinated in the future

Among subjects to be discussed by the Group are priority in the selection of types of cancer for reference activity the organization and objects of an international reference centre in histopathology co-ordination among international centres on the various types of histopathological material ways whereby non governmental organ

Berkov R. (1957) *The International Health Organization: A Study in Decentralized Administration*. G. S. D. Fur-  
 Wertheimer E. (1945) *The International Administrative Organization*. W. A. Hungt-  
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<sup>1</sup> B k R (1957) *The World Health Organization: A study in decentralization of international administration*. Geneva and Paris.

<sup>2</sup> Wertheimer E (1945) *The international system of health administration*. Washington.

<sup>3</sup> Crabol J (1951) *L'Organisation mondiale de la Santé*. Grenoble.

As Regional Nursing Adviser she will plan and initiate regional nursing programmes for WHO and will upon request advise governments and local health authorities on nursing problems. Miss Petterella will also be responsible for the examination of requests for assistance on nursing divisions on programme priorities and for the general supervision of WHO nursing staff in the Eastern Mediterranean Region.

#### TAIWAN NURSING SCHOOL

In Taiwan WHO has been helping to improve standards of nursing education and nursing services through its assistance to the Government in the setting up of a Collegiate School of Nursing. Recently Miss Virginia Jones, Director of the School of Nursing at the University of Hawaii, was appointed WHO Nursing Consultant to the National Taiwan University School of Nursing at Taipei. Her first task will be to consult with the Government and the WHO Nursing Education team already in Taiwan on plans for the new School of Nursing. Miss Jones will also give advice on nursing training programmes for graduate nurses and suggest methods of improving facilities for the training of nurse teachers and supervisors.

Before taking up her appointment in Taiwan, where she will remain for six months, Miss Jones will visit Japan and Korea to acquaint herself with nursing methods in those countries. Miss Jones has had considerable experience of nursing education in the United States of America where she was formerly educational secretary of the National Organization for Public Health Nursing in New York.

#### APPOINTMENT TO STUDY TRAINING CENTRE

Dr Hans Ikringer of Germany has been appointed senior WHO adviser to the tuberculosis demonstration and training centre at Wad Medani in Sudan. The other members of the WHO team at the training centre are a laboratory technician, an X-ray technician and a public health nurse. The principal activities of the centre include (a) study of the epidemiology and prevalence of tuberculosis in the Central Irrigation area; (b) training staff of the tuberculosis control services; (c) establishment of a school for tuberculosis health workers; and (d) provision of services for the town.

Dr Ikringer, who has wide experience of tuberculosis control work in Germany, Switzerland and Indonesia, received his M.D. from the University of Munich in 1937. Before joining WHO he worked on the staff of the General Secretary of the German Control Committee on Tuberculosis.

#### MAURITIUS TUBERCULOSIS CONTROL PROJECT

WHO has already aided the Government of Mauritius in the establishment of a comprehensive tuberculosis control service. As an initial step in developing this service a survey will be made of sample groups of the population. After this has been completed a list will then be given in the organization of a tuberculosis centre in which special emphasis will be placed on laboratory work, epidemiology, standard methods of diagnosis, home visiting services and relevant statistical procedures.

In continuation of the technical help already given by WHO in 1956, Dr Jean Goujou has been appointed WHO team leader as from May 1957. Dr Goujou, who took his M.D. from the Université de Lyon, has been chief of the tuberculosis section of the Ministry of Public Health in Tunisia since 1947. In addition to Dr Goujou, the WHO team in Mauritius consists of an epidemiologist, a statistician, two public health nurses, an X-ray technician and a laboratory technician.

#### HEALTH EDUCATION ADVISER FOR INDONESIA

Miss Madeline McCann has been appointed WHO Health Education Adviser to the Government of Indonesia. Among her duties will be the task of assisting in the organization and conduct of training courses in health education and methods and in the planning and development of health education services. Miss McCann comes to WHO from the University of North Carolina, where she was Assistant Professor of Health Education in the Woman's College. Earlier, when working with the North Carolina Board of Health, Miss McCann was in charge of one of the first pilot demonstration training projects in health education established in the State.

#### ENVIRONMENTAL SANITATION

Mr Y. M. Liu from Taiwan has been appointed WHO Adviser in Sanitary Engineering to the Government of Pakistan. He will first undertake a three-month survey of Lahore, with which a comprehensive project will be developed under his leadership for the supply of water and the construction of sewage systems throughout West Pakistan. Mr Liu obtained a degree in civil engineering at the University of Shanghai and later worked for the national health demonstration in Nanking. He was awarded a Rockefeller Foundation fellowship which enabled him to carry out postgraduate work at Harvard University. Before joining WHO, Mr Liu was

nicians health education vital and health statistics nutrition environmental sanitation malaria control public health administration strengthening of medical teaching facilities medical stores management and training of nurses

Dr Puri in his career as a public health worker has occupied several distinguished professional positions. He has been Secretary of India's Central Council of Health since its inception in 1952 and a member of the governing body and executive committee of the Indian Council of Medical Research. He also served for a period of five years as honorary secretary and member of the governing body and executive committee of the Lady Hardinge Medical College and Hospital New Delhi. Dr Puri represented India at the Joint WHO/FAO Nutrition Seminar held in the Philippines in 1955 and attended the nineteenth session of the WHO Executive Board in January 1957.

#### LABORATORY FACILITIES IN SOUTH EAST ASIA

Due to extreme climatic conditions and the scarcity of trained technical personnel many countries in South East Asia find it hard to maintain high laboratory standards. To help governments in the Region to establish upgrade or maintain laboratory facilities in the field of tuberculosis WHO has recently appointed Dr Eugene Nassau of the United Kingdom as inter-country tuberculosis bacteriologist in the South East Asia Region. Dr Nassau is no stranger to the area or the work as he served in a similar capacity from 1951 to 1952.

#### TUBERCULOSIS RESEARCH APPOINTMENT

Dr Ladislav Sula of Czechoslovakia has recently been appointed medical officer in-charge of the WHO Tuberculosis Research Office in Copenhagen. Dr Sula who received his M.D. in 1938 from the Masaryk University at Brno has had extensive experience in all aspects of tuberculosis particularly in tuberculosis bacteriology where his work has been of international importance.

Since 1955 Dr Sula has been Chief Scientific Adviser to the Ministry of Health and in this position has been responsible for the organization of the tuberculosis control programme in Czechoslovakia which has concentrated mainly on the preventive aspect of the disease. Dr Sula has also played a vital part in the development of the Tuberculosis Research Institute in Prague.

#### PARASITIC DISEASES SURVEY

A survey of parasitic diseases in the North Western area of the Federation of Rhodesia and Nyasaland

has recently been initiated with WHO assistance. The plan of this project is to investigate the relative importance of parasitism and diet as a cause of ill health in the area. WHO has appointed Dr Fergus S. McCullough as a Consultant Parasitologist to undertake a six month survey of parasitic diseases. In this work he will devote special attention to the bilharziasis problem.

Dr McCullough who holds a Ph.D. and M.Sc. from Queen's University Belfast was formerly working in Ghana as a medical biologist. He has published a number of scientific reports on the epidemiology of bilharziasis and on the susceptibility of snails to the schistosome.

#### BILHARZIASIS CONTROL IN IRAQ

The WHO assisted bilharziasis control project in Iraq aims at strengthening the Government's programme for bilharziasis control by pilot studies and demonstration of control methods using the new molluscicides. In the course of this work special attention is given to snail control treatment of patients environmental sanitation and health education. The project now has a new Senior Adviser in the person of Dr C. Kihl who was formerly epidemiologist at the Qalyub Demonstration and Training Centre in Egypt and who has been transferred to Baghdad.

#### NURSING ADVISERS IN EASTERN MEDITERRANEAN

The new Regional Nursing Adviser in WHO's Eastern Mediterranean Regional Office Miss Jeanette Pitcherella of the United States of America took up her duties on 15 May 1957. She succeeds Miss Inger Goetszche one of whose last assignments in this post was to visit Iraq and Iran on behalf of the Organization. In Iraq she discussed the possibility of starting up a school for the training of professional nurses and while in Iran visited the WHO assisted Nursing School at Rey near Teheran and the Maternal and Child Health Demonstration Centre in Teheran itself. The latter institution is a joint project of the Iran Ministry of Health WHO and UNICEF.

Miss Pitcherella who did post graduate work at Columbia University New York in nursing education and public health nursing administration has for the past six years been working on various WHO assisted projects. Among her previous assignments were those of chief project nurse in the Rural Public Health Demonstration Centre in El Salvador and more recently of Zone Nursing Adviser in Guatemala.

with resolution WHA3.11 of the Third World Health Assembly and resolution EB15.R7 of the WHO Executive Board.<sup>1</sup> Under this procedure efforts are made to obtain suggestions for non proprietary names by submitting proposals to the members of the WHO Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations designated for this purpose. A Sub-Committee on Non Proprietary Names of the WHO Expert Committee on the International Pharmacopoeia is meeting in Geneva from 13 to 15 June 1957. The main purpose of this meeting is to examine the names proposed by different authorities for a number of new medicinal substances and

to select names on the basis of these suggestions. In addition ways and means for effecting a rapid selection of names for narcotic drugs are to be discussed. Comments on and objections to names previously proposed and arrangements whereby this work may be facilitated are also to be examined during the course of the meeting.

It is noteworthy that the names already suggested by WHO have been well received in the various countries. Four lists of proposed international non proprietary names have been published.<sup>2</sup> A fifth appears below and it is expected that a further list will be issued after the June meeting.

### PROPOSED INTERNATIONAL NON PROPRIETARY NAMES (*Prop INN*) LIST 5

In accordance with Article 3 of the Procedure for the Selection of Recommended International Non-proprietary Names for Pharmaceutical Preparations it is hereby given that the following names are under consideration by the World Health Organization as Proposed International Non Proprietary Names.

Comments on, or formal objections to these proposed names may be forwarded by any person to the Pharmaceutical Section of the World Health Organization within four months from 1 August 1957.

The inclusion of a name in this list does not imply any recommendation for the use of the substance in medical or pharmacy.

Proposed International Non-proprietary Name (Latin, English)	Chemical Name or Description
acetylmethadolium	6-dimethylamino-4,4-diphenyl-3-acetoxyheptane
acetylmethadol	
alphacetylmethadolium	$\alpha$ -6-dimethylamino-4,4-diphenyl-3-acetoxyheptane
alphacetylmethadol	
alphamethadolium	$\alpha$ -6-dimethylamino-4,4-diphenyl-3-heptanol
alphamethadol	
anileridinium	1-[2-( $\beta$ -aminopropyl)ethyl]-4-phenylpiperidine-4-carboxylic acid
anileridine	ethyl ester
betacetylmethadolium	$\beta$ -6-dimethylamino-4,4-diphenyl-3-acetoxyheptane
betacetylmethadol	
betamethadolium	$\beta$ -6-dimethylamino-4,4-diphenyl-3-heptanol
betamethadol	
betaprodinium	$\beta$ -1,3-dimethyl-4-phenyl-4-propionoxypiperidine
betaprodine	

For full description of this procedure see *Chrom. Med. Hist. Org.* 19 6, 10 16.

See *Chrom. Med. Hist. Org.* 1953, 7 197; 1954, 8 216, 313; 19 6, 10 18 A 1. Recommended international non-proprietary names as published in *Chrom. Med. Hist. Org.* 1955, 9 185.

Vice Commissioner of the Department of Reconstruction of Taiwan

#### RURAL HYGIENE IN SOUTH EAST ASIA AND THE WESTERN PACIFIC

A WHO consultant will shortly visit the various countries of the South East Asia and Western Pacific Regions for the purpose of helping to assess their rural hygiene problems at first hand. This work is in preparation for a Conference on Rural Hygiene to be held in Ceylon towards the end of October of this year in which the public health administrators various categories of senior supervisors of rural health work sanitary engineers and teachers of public health will be taking part.

The main purpose of this Conference is to define the rural health needs of the two Regions and to devise methods whereby these needs may be met within the social and economic framework of the countries concerned.

Dr Estella Warner late of the United States Public Health Service has been chosen by WHO to act as consultant. Apart from her long record of distinguished service in her own country—as an expert in maternal and child health the organization of local health services and general public health administration—Dr Warner has in the past given signal service to various other countries including Lebanon and India. Recently she held the post of consultant in public health administration to the United States Operation Mission in Ceylon.

## *International Non-Proprietary Names for Pharmaceutical Preparations*

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Every year large numbers of new medicinal substances are introduced into the materia medica. This involves a certain hazard to public health by reason of the relatively short time that elapses between the discovery of a new substance and its introduction into therapeutics in a large number of countries. In these circumstances it is important that no time should be lost in devising methods of assay and in obtaining essential information on the toxicity pharmacological and clinical action and side effects of the new substances.

Another problem arises in nomenclature by the creation on the one hand of proprietary names for use by the manufacturer and on the other of non proprietary or open names for use by national authorities or the authors of scientific papers pharmacopoeias and other works of specification. For the latter purpose every attempt should be made to achieve uniformity in order to avoid the confusion likely to arise where a variety of non proprietary names exists for the same medicinal substance. In the interests of international public health

and commerce the World Health Organization has been asked to play a part in co-ordinating the efforts which many countries have already made to lay down a nomenclature for important new pharmaceutical preparations. In the case of addiction producing drugs a uniform nomenclature greatly facilitates their international control.

It must be recognized that in this work it is clearly impossible to select names of reasonable length which after sufficient search would not be found to conflict with existing rights to names—registered or unregistered—in one or another country. The operation of the programme must therefore be based on good will.

It is important to afford governments and other interested parties an opportunity of checking whether a proposed name conflicts with trade or other names in their particular country account being taken of differences in trade mark legislation among the 84 Member States and 4 Associate Members of WHO.

A procedure for the selection of recommended international non proprietary names has already been adopted in accordance



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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desomorphinum	dihydrodesoxymorphine
desomorphine	
dimepheptanolum	6-dimethylamino-4,4-diphenyl 3 heptanol
dimepheptanol	
dioxaphetyli butyras	4-morpholino-2,2 diphenyl ethyl butyrate
dioxaphetyl butyrate	
dipipanonium	4,4-diphenyl 6-piperidino 3 heptanone
dipipanone	
ethoheptazinum	1 methyl-4-carbethoxy-4-phenylhexamethyleneimine
ethoheptazine	
hydroxypethidinum	1 methyl-4-(3 hydroxyphenyl)-piperidine-4-carboxylic acid ethyl ester
hydroxypethidine	
metethoheptazinum	1,3 dimethyl-4-carbethoxy-4-phenylhexamethyleneimine
metethoheptazine	
metheptazinum	1,2 dimethyl-4-carbomethoxy-4-phenylhexamethyleneimine
metheptazine	
methyl-desorphinum	6-methyl $\Delta^8$ desoxymorphine
methyl-desorphine	
methyl-dihydromorphinum	6-methyl-dihydromorphine
methyl-dihydromorphine	
myrophinum	myristyl ester of beazylmorphine
myrophine	
normethadonium	4,4-diphenyl 6-dimethylamino 3 hexanone
normethadone	
oxpheneridinum	1 (2 phenyl 2 hydroxyethyl)-4-carbethoxy-4-phenylpiperidine
oxpheneridine	
oxymorphonium	dihydrohydroxymorphine
oxymorphone	
pheneridinum	1 (2 phenylethyl)-4-carbethoxy-4-phenylpiperidine
pheneridine	
phenomorphanium	3 hydroxy <i>N</i> phenethylmorphinan
phenomorphane	
proheptazinum	1,3-dimethyl-4-phenyl-4-propionytyhexamethyleneimine
proheptazine	
propenidinum	1 methyl-4-phenylpiperidine-4-carboxylic acid isopropyl ester
propenidine	
propoxyphenum	4-dimethylamino-1,2-diphenyl 3 methyl 2 propionytybutane
propoxyphene	
thebaconum	acetyl-dihydrocodeinone
thebacon	

## THE CHALLENGE OF ATOMIC ENERGY

In his age long struggle for survival man has proved over and over again that he is an adaptable animal. Over the years he has always been ready to accept new ideas and turn them to practical use. Never has he been deterred from doing so by considerations of difficulty or danger. With courage and determination he has surmounted each obstacle in the path of progress. But perhaps in his whole history he has never had to face such a challenge as he has today—the safe exploitation of atomic power. The peaceful potentialities of nuclear energy are immense but so are the dangers inherent in its misuse. That the nature of these dangers should be fully understood and effective methods of avoiding them developed has become a matter of importance for the whole human race and is a problem which calls for bold and timely action both nationally and internationally.

It was at the end of 1954 that the World Health Organization began to take an active interest in the problem when the Director General of WHO called to either four consultants—Dr J. C. Bugher from the USA, Dr A. J. Cipriani from Canada, Dr J. F. Loutit from the United Kingdom and Professor C. Manneback from Belgium—to advise the Organization on its future policy in this field. Here I should like on behalf of WHO to pay a tribute to the late Dr Cipriani whose untimely death was not only a great personal tragedy to his many friends at home and abroad but is also a sad loss to the world. To him WHO owes much for he had a great influence on our early thinking in matters relating to the health aspects of atomic energy.

WHO's policy has changed little in the last four years. The hazards of atomic energy have been discussed repeatedly at the World Health Assembly and by the Executive Board and the liveliness of the debates has reflected the keen interest shown in this problem.

A recent important development in WHO's atomic energy programme was the convening of a group of experts to discuss the question of the genetic effects of radiation on man—a question that has aroused considerable interest in many quarters. The report and working papers of this international group of experts have just been published by WHO under the title *Effect of Radiation on Human Heredity*. This work brings to the medical profession up-to-date information on this complex and controversial issue and suggests lines for future research.

The potential danger to the human race itself in man's increasing use of radiation is of course a long term problem. Of more immediate but no less urgent concern is the question of the hazards involved in the indiscriminate use of X rays for diagnostic purposes. This matter has been taken up by the United Nations Scientific Committee on the Effects of Atomic Radiation which was set up by the General Assembly of the United Nations in 1955. The functions of this committee are to receive and assemble information on observed levels of radiation and on the effects of radiation on man and his environment. The UN Committee was much impressed by the total contribution of medical X radiation to the average radiation

## SCHEDULE OF MEETINGS

- 26-30 August    Expert Committee on the Public Health Aspects of Water Fluoridation  
Geneva
- 5-11 September WHO Regional Committee for the Western Pacific Region Eighth  
Session Hong Kong
- 9-14 September Study Group on Schizophrenia    Geneva
- 10-13 September WHO Regional Committee for Europe Seventh Session Copenhagen
- 16-21 September Expert Committee on Biological Standardization    Geneva
- 16-21 September WHO Regional Committee for Africa Seventh Session Brazzaville
- 16-21 September WHO Regional Committee for South East Asia Tenth Session Rangoon
- 16-27 September Pan American Sanitary Organization Directing Council X Meeting/  
WHO Regional Committee for the Americas Ninth Session Washington  
D.C.
- 23-27 September WHO Regional Committee for The Eastern Mediterranean Sub  
Committee A Alexandria
- 7-11 October \* WHO Regional Committee for the Eastern Mediterranean, Sub  
Committee B<sup>1</sup>
- 23-28 October    Expert Committee on Professional and Technical Education of Medical  
and Auxiliary Personnel Geneva

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Te tat    date

*The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.*

## EFFECT OF RADIATION ON HUMAN HEREDITY

Problems arising from the exposure of man to irradiation are extremely numerous. They bear on many aspects of his health and his children's health. To the extent that the original exposure—medical or industrial—aims at improving man's welfare, be benefits to the extent however that the exposure does him bodily harm or induces gene mutations that will harm his offspring, he suffers."

Disquiet about the genetic effects of ionizing radiation began to be felt in some quarters soon after Professor H. J. Muller's demonstration in 1927 of the mutagenic action of X rays in fruit flies. But it is only since the advent of atomic energy with its accompanying intensive research into radio biology that interest in the problem has become so widespread.

Widely differing opinions have been expressed as to the possible consequences of increasing mutation following the widespread exploitation of atomic energy and other forms of radiation. While some people appear to be unequivocally optimistic, others have voiced doubts in particular the much publicized views that the use of nuclear energy is bound to increase the rates of mutation and that all mutations are necessarily harmful have given rise to considerable public alarm.

Various efforts have been made recently to assess the dangers inherent in the use of ionizing radiation and the possible means of avoiding them.

The first conducted in the United States of America under the auspices of the National Academy of Sciences—National Research Council has resulted in two publications entitled *The Biological Effects of Radiation Summary Reports* which gives the technical findings and *A Report to the Public* which is intended for the lay reader.

The second attempt was a review of the existing scientific evidence on the medical aspects of ionizing radiations and was

undertaken by a committee established by the Medical Research Council of Great Britain. The Committee's final report *The Hazards to Man of Nuclear and Allied Radiations* was presented to Parliament and represents the most authoritative opinion on the subject expressed as yet in the United Kingdom.

The third and most recent report on the subject has been made at the international level by the World Health Organization. The scope of the WHO Study Group on the Effect of Radiation on Human Heredity was however much more limited than that of the two previously mentioned studies. "The first aim was to obtain the opinions also of authorities on genetics from countries other than those whose national committees have already stated their views. The second was to hear the opinions of a number of experts on an aspect relatively lightly touched upon in the national reports—namely the lines of research which should be followed in the light of present knowledge to increase our understanding of the genetic effects of ionizing radiations on man.

Another important body in this field is the United Nations Scientific Committee on the Effects of Atomic Radiation. This committee was established by the General Assembly of the United Nations and has wide terms of reference to receive and assemble information on observed levels of radiation and on the effects of radiation on man and his environment. The committee is due to report in July 1958. The WHO study group's report and papers were presented to the UN committee for the information of members.

The WHO study group met from 7 to 11 August 1956 at the University of Copenhagen immediately after the First International Congress of Human Genetics. The papers presented at the meeting as well as the formal report of the group have just been published under the title *Effect of Radiation*

exposure of populations and the conclusions reached in its statement. The Responsibilities of the Medical Profession in the Use of X rays and other Ionizing Radiation are obviously of direct import for the whole medical profession.

The radiologist and the general practitioner alike will not fail to appreciate the serious implications of the recent warning of the UN Committee but it is to be hoped that they will be equally alive to other dangers of which the scope and potentialities have not as yet been adequately assessed. Among such dangers is the hazard of exposing early human embryos to X radiation, a risk that was pointed out by Russell & Russell<sup>1</sup> at the First International Conference on the Peaceful Uses of Atomic Energy convened by the United Nations in 1955 and that was mentioned during the discussions at the Tenth World Health Assembly.<sup>2</sup> From the Russells' work on mice it appears that moderate doses of radiation, especially at a very early stage in the life of an embryo, may cause various deformities. If occupational irradiation does not exceed the accepted permissible weekly dose, there is very little reason to consider it a direct potential hazard to the embryo. The situation is different, however, for some types of medical application of X rays. Therapeutic irradiation of the pelvic region would certainly involve considerable risk to an embryo in the direct beam. Also, however, certain diagnostic procedures involving unusually high dosage, particularly those using fluoroscopy, might fall into the dose range that experiments on mice have shown will at least occasionally produce deformities. And there is no reasonable guarantee that the human embryo is not exposed to similar dangers.

Some of the developments illustrated in this issue of the *Chronicle* mark but the first few steps of a long and difficult journey through an uncharted land. The ultimate answer to the challenge of atomic energy will rest on the present generation's alertness, ingenuity and determination to face up to its responsibilities.

D<sup>r</sup> PIERRE DOROLLE  
Deputy Director General  
World Health Organization

<sup>1</sup> Russell, L. B. & Russell, W. L. (1956) *Hazard to embryo and fetus from ionizing radiation*. 1. Proceedings of the First International Conference on the Peaceful Uses of Atomic Energy, 1955, N.Y. 111, p. 175.  
<sup>2</sup> Minutes of the fourteenth meeting of the Committee on Programme and Budget (to be published in *Off. R. Wld Hlth Org.* 79).

mutation of a type previously unknown may very well have occurred at some time in the past as a spontaneous mutation and therefore the hypothesis that ionizing radiations cannot induce new types of mutation like so many other hypotheses in biology can neither be proved nor disproved. For practical purposes however geneticists have placed so much faith in this hypothesis that all deductions concerning the genetic hazards of exposure to ionizing radiation are based on it. Since there is no theoretical or experimental basis for assuming that man made radiations can produce alleles of an unknown type many of the views expressed in science fiction and other forms of popular literature belong to the realm of fantasy.

When assessing the dangers resulting from the exploitation of nuclear energy it is also useful to bear in mind that probably "ionizing radiation is responsible for only about one tenth of human spontaneous mutations" and, as Carter goes on to say "leaving nine tenths to be accounted for we should be unwise to ignore the possibility that chemical substances may be much more important than ionizing radiation as a cause of human mutation."

But what is perhaps even more relevant and important than the foregoing is that a better understanding of the likely effects of new mutations will be obtained if it is remembered that the final effect of a gene unlike the gene itself may be extremely variable depending upon the other allele at the same locus the alleles at other loci and the mass of non genetic factors grouped together under the term environment. This aspect to Carter's mind deserves particular attention since in no two individuals are the total phenotype and the total environment identical and therefore in no two individuals can the same allele be expected *a priori* to produce identical end effects.

Professor L. S. Penrose among other geneticists has emphasized the part which genes that are disadvantageous when homozygous but advantageous when heterozygous may play. Such genes are well known in animal work and recently a considerable

amount of evidence has been adduced that symptomless red blood-cell sickling (the heterozygous state) and the severe sickle-cell anaemia (homozygous expression of the same gene) are examples of the same mechanism in man. It is thought that although sufferers from sickle cell anaemia produce very few children the trait is kept up in a population in a malarious area by the greater likelihood of survival of offspring from parents with the heterozygous sickling trait compared with individuals not affected by sickling. This is probably due to an increased resistance to *Plasmodium falciparum* malaria by the heterozygous sickle-cell carrier as contrasted with normal individuals.

Improved environmental conditions in this case abolition of malaria would therefore tend to bring about gradual elimination of the gene by abolishing the advantage of the heterozygous state. How far recessive genes producing other diseases than sickle-cell anaemia would be eliminated by improved environmental conditions is of course a matter for further research. The theory is full of interest and is directly opposed to the school of thought which maintains that improved environmental conditions by allowing unfit children to grow up to reproductive age would necessarily increase the number of detrimental genes in the population.

In his contribution Dr Bruce Wallace discusses in some detail the two main concepts regarding the genetic structure of human populations "that individuals of the highest possible fitness are completely homozygous" and that the individual with the highest fitness is genetically heterozygous rather than homozygous."

If the first concept were true for the human species natural selection would tend to establish a population composed entirely of homozygous individuals. Theoretically in such a case individuals of one generation would be identical with those of the next. Since mutations would tend to prevent the population from reaching the level of fitness theoretically possible they would have to be regarded as deleterious by definition. Muller, Crow and Haldane have all studied this concept.

on Human Heredity<sup>1</sup> It is impossible here to present concisely all the technical information that has stemmed from this meeting This account does not therefore purport to be a systematic and comprehensive summary of the information gathered for or made available to the study group but merely aims at giving an idea of its main lines of approach

### Sources of radiation

Before attempting to define the genetic problem and summarize the various ways of tackling it a few words must be said about the sources from which man is likely to be irradiated These can be classified broadly into two groups the natural sources to which he has been exposed since time immemorial (cosmic rays radiation from the radioactive elements present in the earth's crust and in the human body itself) and the artificial sources to which he has been exposed for only half a century or less (X ray apparatus for diagnosis therapy or industrial use nuclear reactors luminous watches and television screens artificial radioactive elements which have been distributed in nature as a result of man's activities) While it is of course in the man made sources that the geneticist's main interest lies a knowledge of the intensity of the radiation from natural sources is essential if the increase in the general level of radioactivity expected to result from man's increasing use of radiation in medicine and industry is to be accurately assessed

Estimates of the doses of radiation received by individuals and by large population groups from these various sources are given in Professor R M Sievert's paper in *Effects of Radiation on Human Heredity* From this it appears that at present the most important contributions to the average gonad dose come from cosmic rays from the natural radiation from the earth's crust and from naturally slightly radioactive elements in man's own body such as potassium By far the most important man made contribution

at any rate in the United States of America, Great Britain and Sweden is from diagnostic X rays Further data on diagnostic exposures are to be found in the contribution by Dr W M Court Brown

### The genetic dilemma

The pioneer work of H J Muller on insect populations has established beyond doubt that exposure to ionizing radiation produces increased rates of mutation that is increased rates of permanent alterations in the genes responsible for the determination of particular hereditary traits In addition to such point mutations it has been shown that actual chromosome breaks may be produced often with a consequent reduction in fertility The first of the signed papers in the volume published by WHO is by Professor Muller and describes the work on animals and the deductions which may be drawn from it

There is a dearth of direct information about the genetic effects of ionizing radiation on man but geneticists agree that irradiation does induce mutations of which some at least are bound to be deleterious This point of view is reflected in the American and British reports and in the more recent WHO publication Where opinions differ is on the question of the proportion of mutants expected to be unconditionally harmful and the relative importance of natural selection and increased mutation rates Stated rather differently one of the points of controversy is whether or not it is an extreme view to consider that each new mutation is unconditionally harmful and will sooner or later be eliminated by natural selection's determining a genetic death

Dr T C Carter's contribution reviews some of the arguments likely to bring some relief to the extreme pessimist In the first place argues Carter it is commonly accepted as a working hypothesis that ionizing radiations do not induce new types of mutation but only raise the mutation rates of existing alleles This is not surprising since living matter is continuously exposed to natural background radiation An induced

derived from three main sources: radiotherapeutic experience, radiologists' occupational experience, and observation of a population exposed to the radioactivity released during nuclear explosions to date, however, none of these has yielded conclusive information.

The results of the very thorough genetic investigation of the first generation of descendants of those exposed to radiation at Hiroshima and Nagasaki have recently been published.<sup>2</sup> That they were largely negative was not, however, unexpected by geneticists in view of what is known about the difficulty of demonstrating mutations in either animals or man.

A further approach, using as material the offspring of patients irradiated for clinical reasons, has been undertaken in France, and an account of this interesting work is given by Dr J. Lejeune. Lejeune explains how the sex ratio in the offspring of irradiated individuals can serve as an indicator of the production of lethal genes. It is, he writes, essentially in the X-chromosome that the lethal genes can be detected through a study of the sex ratio. Owing to the chromosomal structure of sex, the X-linked lethal mutations appear in different forms according to the sex of the irradiated parent. Thus, in the offspring of a woman exposed to radiation, dominant lethal mutations linked to the sex chromosome have no effect on the sex ratio, whereas sex-linked recessives bring about a deficit of boys. The contrary is true of men, in whose progeny only the dominant lethals manifest themselves by bringing about a deficit of girls. In Lejeune's opinion, the sex ratio, although it has certain limitations, is the most sensitive touchstone for detecting the production of lethal mutations in the first generation of children born of irradiated parents. A proviso should perhaps be made here that the sex ratio is notoriously inconsistent in mammalian biology, and so a presumption that variation in a particular direction is due to genetically induced lethals may not invariably be valid.

Animal experiments, particularly on fruit

flies and mice, have been one of the richest sources of information, but how far the numerical results obtained can apply to man is a question on which much more requires to be learnt. The diverse problems involved in extrapolation from animals to man are set out clearly in the paper by Dr J. V. Neel.

To the above, the ingenuity of the geneticist has added some other sources of information, less important until now, but showing promise of being fruitful in the future. A good illustration is the study of the age group in which fresh mutations are observed. Penrose points out the value of this approach.

Clearly, the older the parent, the more likely he is to have been subjected to mutagenic influences. If the influence is background radiation at the age of 40, the dose will have been twice that received at the age of 20. The net effect on parental age distribution of diseases in the offspring caused by background radiation alone, though definite, would be slight. The expected average increase would be scarcely more than one year above normal parental age. Marked effects confined to one or other parent have, however, been observed in several malformations. Marked increase of father's age has been found in chondrodystrophy and acrocephalosyndactyly.<sup>3</sup> The reader will find some substantiating data and a discussion of the problem in Penrose's paper.

Another line of attack, likely to yield valuable genetic data, is the study of malformations, disease and mortality in populations with very high inbreeding rates. Dr N. Freire Maia has drawn attention to the existence of such populations in Brazil, where much information can be obtained through the analysis of marriage records and where studies are already in progress. Although, as he says, it is unfortunate that "in the zones in Brazil where the very high inbreeding rates prevail, no analysis regarding the incidence of specific hereditary anomalies seems feasible because the level of medical practice there is lower than in the larger cities, nevertheless, in these regions, a study can be made of such population characteristics as the frequencies of abortion

<sup>2</sup> Neel, J. V. & Schull, W. J. (1956) *The sex of power*  
*for atomic bomb on progeria: irradiation in Hiroshima and*  
*Nagasaki*. Washington, D.C.



According to the second concept the individuals of a population would be as similar phenotypically (that is from the point of view of their anatomical physiological and psychological structure) as is consistent with the demands of natural selection but at the same time they would be genetically diverse.

The selective coefficient of any gene in this type of population would be a function of the genetic situation prevailing within that population. Since the population consists of individuals of diverse genotypes selection would be constantly shuffling gene frequencies and selective values simply because of the uncertainties associated with the formation of chance gene combinations.

In contradistinction to the first the second concept has not been studied theoretically to any appreciable extent.

The two concepts as Bruce Wallace points out are contrasting but are not mutually exclusive. It may develop that one or the other is substantially correct. It may be that for some loci one is correct while for others the second applies. It is quite probable that different species differ in their genetic structure. Finally at different times and in different places the genetic structure of a population may shift from one model to the other.

It will be clear from the foregoing how important it is to obtain a better idea of the genetic structure of human populations. Such knowledge would in fact make it possible not only to assess the genetic hazards of irradiation with greater certainty but also to formulate reasonably accurate predictions. Unfortunately as Carter points out this is a problem of exceptional inherent difficulty because we may expect that the more easily recognized genes will largely be among those with notable detrimental effects and conversely that the conditionally advantageous genes will be mainly among those with minor effects and may for just this reason be difficult to recognize.

These then are the great problems which confront the geneticist at the beginning of what is commonly called the atomic age and which so urgently need to be answered.

How much increase of the natural mutation rate in man is produced by ionizing radiation? What is the role of chemical substances in the production of new mutations at the present time? Can an improved environment by indirect means bring about genetic improvement? Are all induced mutations necessarily harmful? Should predictions be formulated on the basis of equations under a model that stresses homozygosity? While not providing any final answers the two national reports and the recent WHO publication present much useful information to those interested in the subject. No matter what the answers may be it is surely significant that no member of the study group disagreed that the cumulative effect of increasing mutation rates in man is likely to be harmful to the health and welfare of future generations and that the same conclusion couched in different terms was reached by both the American and the British national committees.

### Looking into the future

It is clear then that knowledge of the measures which must be taken to protect large populations will largely depend on the success of future research in the field of genetics both animal and human. Moreover the medical profession has a particular responsibility in developing the science of human genetics which is in most of its aspects so closely tied up with clinical and public health work.

In recent years states the study group's report considerable quantitative knowledge has been accumulated on the basic mechanisms of genetics. There are strong grounds for believing that most genetic effects are very closely additive so that a small amount of radiation received by each of a large number of individuals can do an appreciable amount of damage to the population as a whole. There are however many gaps in knowledge particularly concerning these effects in man. Attempts to obtain direct information about the effects of ionizing radiation on human heredity have so far been

doses and types of radiation applied at different stages of the life-cycle under a variety of conditions and utilizing different kinds of organisms

— Study of the role of changes in the hereditary material of somatic cells in the genesis of leukaemia and various neoplasms. This is now possible owing to the recent developments in tissue-culture techniques

— Study of the means of protection against mutagenic agents

— Development of new and improved techniques for the identification of mutants many of which remain unrecognized at the present time

— Study of the manner of gene action. Dominance synergism and other forms of gene interaction including the role of the environment are important in appraising the effects of radiation and should be further studied in both man and animal

— Study of factors such as natural selection in populations through the collection of demographic and experimental data. This type of research is indispensable if the genetic structure of past and present human communities is to be understood and future trends are to be predicted

— Study of patterns of mating in human populations such as inbreeding and their genetic implications

— Twin studies in man which are known to be helpful for the understanding of many problems of human heredity

— Determination of the frequency of diseases with a significant genetic component with particular reference to their epidemiology. Central registration of data on human inbreeding and hereditary disease is believed to be "of the utmost importance"

— Study of populations of special genetic interest such as relatively stable primitive communities long isolated by geography or culture and communities exposed to unusually high background radiation

— Genetic mapping of human chromosomes

— Studies of cytochemistry and human cytology particularly investigation of the ultramicroscopic structure and chemical composition of the hereditary material and of the manner in which this is altered by irradiation and other mutagens

— Development of new statistical methods for analysing the data obtained from research in human and experimental population genetics

Investigations capable of throwing fresh light on all these problems will involve a very great effort in many countries and "a great expansion of general and *ad hoc* research in genetics and other fields of biology" with the closest possible collaboration between those working in the experimental and the human fields. The report of the study group emphasizes that "there is at present an insufficient number of institutions where an adequate training in genetics particularly in human genetics can be given". The group believes that "medical undergraduates should all receive training in genetics and the teaching should be co-ordinated with that in radiology and in the use of radioactive substances in medicine so that the genetic hazards of diagnostic and therapeutic procedures are thoroughly understood. Medical men training as radiologists should have specific more advanced instruction in genetics. Health physicists, radiological physicists and radiological technicians should also receive instruction in genetics as part of their technical training

It seems essential that instruction in genetics should be given to all scientists particularly those whose work is likely to involve the use of radiation and radioactive materials in research. The principles of human genetics could with advantage be conveyed to those training in the social sciences by means of formal instruction

The study group was particularly concerned about the genetic hazards of radiation from sources used in medicine, industry, commerce and experimental science. As the report puts it: "Both as an approach to control and as providing basic background

miscarriage stillbirth infant mortality malformations as a whole etc and should afford some interesting results Furthermore in Rio de Janeiro Sao Paulo and some other cities where the inbreeding rates are probably from ten to twenty times higher than those prevailing in similar or even smaller cities in the USA and where very good hospitals exist a complete and detailed analysis is possible This type of research may prove to be very rewarding

The comparison of mutation rates in two communities with different levels of background radiation is yet another way of gleanings useful genetic information but as Professor A C Stevenson explains in his paper it is a way beset with difficulties since background radiation normally varies so little from place to place Not wishing to strike too pessimistic a note however he concludes that serial comparisons of a number of defined areas for several traits with carefully planned control of diagnostic standards and ascertainment and the simultaneous collection of background radiation information would perhaps be more valuable than a comparison between two areas only

A special opportunity for making such mutation rate comparisons has been indicated by Dr A R Gopal Ayengar who points out that a population of about 100 000 has lived in virtual isolation for very many generations in Travancore India where the background radiation is unusually high owing to the presence of monazite—the principal ore of thorium—in the soil Now in the monazite belt of Travancore writes Gopal Ayengar we have an almost unique situation where there would appear to be no relaxation of the forces of selection on the population since the alleviating action of modern medical services has not found its expression to any appreciable degree The population has been more or less stationary for generations and might be expected to show differences in mutation rates for particular traits—autosomal dominants or sex linked recessives of the type discussed by Professor Stevenson in his paper A control population of comparable dimensions with

similar demographic conditions and normal background radiation exists in the nearby areas

An inquiry of such a nature would obviously be a long range one but would be well worth doing in view of the possibility of thus obtaining some direct evidence on the genetic consequences of naturally occurring high background radiation The investigation would also be likely to shed light on the dosage relationships for doubling the spontaneous mutation rate and other cognate problems Moreover it might also reveal interesting somatic effects such as the incidence of leukaemia cancer and other conditions

Finally, Dr H B Newcombe advocates an entirely new line of approach to the detection of genetic trends in public health He points out that analysis of the routine registrations of births marriages and deaths by families would yield a great deal of valuable information The establishment of a Family Register Index—in other words a family tree on an enormous scale—would make it possible to determine the incidence of any given disease condition among three groups of people the population as a whole the offspring of first cousin marriages and the siblings of affected individuals Hence it would be possible to differentiate the genetic from the environmental causes of ill health Newcombe stresses the essentially long term nature of this scheme but indicates several ways in which the same data could be applied to shorter term genetic research

All the above possibilities were considered by the study group and are discussed at some length in the individual contributions of the participants The group felt that it should not recommend specific research projects but rather indicate the larger gaps in knowledge as they appear at the present time The following is in brief form the inventory of problems which the group drew up and which will need to be investigated by geneticists nationally or internationally

— Further study of spontaneous and artificially induced mutation particularly on the kinds of mutation produced by various

ities of it but as the radioactive isotope of this element is difficult to prepare and to use on account of its low radiation energy strontium 89 which is equally easily absorbed by the larvae was preferred. The bath contained 10-20  $\mu\text{mc/ml}$  of phosphorus 32 or 20  $\mu\text{mc/ml}$  of strontium 89. The larvae placed in the bath develop normally and produce adults with a radioactivity of 2-16  $\mu\text{mc}$  according to the number of larvae bred in the same bath and the composition of the medium. The concentration of radioactive isotopes is greatest in the legs and practically nil in the wings. Excretion is insignificant in males and in unfertilized females. This technique of collective breeding and marking has the advantage that a great number of larvae can be labelled simultaneously with a minimum of manipulation and side-effects. The amount of radioactivity remaining in the adult is sufficient for detection for one month after release. This radioactivity may be detected (to a minimum of 1  $\mu\text{mc}$ ) by means of a Geiger Muller counter or by autoradiographs with the use of the following technique: the mosquitos to be examined are mounted dry in series on an X-ray film and after 24 hours images are obtained such as those shown in the figure.

In *Aedes aegypti* concentrations of 167-200  $\mu\text{mc/ml}$  of radioactive isotopes have caused lesions and functional disorders affecting the ovaries and the formation

depositing and hatching of eggs. Lesions of the same kind have been observed in *Drosophila* and certain species of *Culex* treated by X-rays. In the case of *Anopheles atroparvus* which is less affected by such concentrations than *Aedes aegypti* larvae of the second generation were found to be still slightly radioactive.

Under the same conditions females from larvae bred in a radioactive bath of innocuous concentration are twice as radioactive as males. They lose about half their radioactivity after oviposition. In parallel experiments with radioactive phosphorus and radioactive strontium it was found that as a result of oviposition the female lost four times more phosphorus than strontium. It is easy to imagine the usefulness of such a method for studying the chemical changes associated with the formation, laying and development of eggs and the biochemical reactions which take place during these various stages.

Collective marking has made it possible to determine the dispersion and flight range of certain species of mosquitos. Table I gives a few examples. It seems that *Aedes aegypti* is distributed more by wind drift than by its own flight. The maximum life span observed between release and capture was 28 days. Males and females travelled the same maximum distance but the survival of males was only a fraction of that of females.

AUTORADIOGRAPHS OF A SERIES OF *A. Aegypti* LABELLED WITH P 32 AND EXHIBITING VARYING RADIOACTIVITIES



Upper	—mal	10	18	30	40	180 $\mu\text{mc}$
Lo	—f m l s	5	38	50	148 $\mu\text{mc}$	

information for relating quantitatively radiation exposure and effects on man it is essential that methods be found of recording exposures to individuals and populations however difficult this may prove

There is reason to believe that radiation exposure can be much reduced therefore those in charge of sources of ionizing radiation should always ensure that there is adequate justification for exposing individuals to doses however small. On account of the danger to offspring resulting from irradiation of the gonads by X rays consideration should be given to determining what efficient means of shielding the gonads could be devised and

brought into general use. In addition in every exposure the X ray beam ought as far as practicable to be directed so that a minimum of radiation reaches the gonads.

The precautions which will have to be taken if nuclear energy is to be safely exploited are manifold and only the future can show how far the human race can live up to its responsibilities in this respect. Just as important however as the study group stressed is the intelligent use of diagnostic and therapeutic X rays or radioisotopes so that their benefits may be at a maximum and any possible long term genetic hazard reduced to a minimum.

## RADIOISOTOPES AND INSECT BIOLOGY

Several articles in this issue of the *Chronicle* draw attention to the effects of radiation and the measure called for on the part of the authorities responsible for protecting public health both as regards the genetic effects and the danger that may be presented by the accumulation of radioactive waste products.

In contrast with these problems concerned with radiation protection some of the public health uses of radioactive isotopes may usefully be described. Their application in the field of medical diagnosis and treatment is well known. It is also known that thanks to radioactive elements—called tracers because of the work assigned to them—it is possible to trace the path followed by the main chemical groups in an organism, their reactions, their localization and their movement in living matter. For a number of years studies of the same kind have been conducted on insects to explore problems which have remained among the most obscure in medical and agricultural entomology for lack of a satisfactory method of tackling them.

In an article which recently appeared in the *Bulletin of the World Health Organization*<sup>1</sup>

from which the following data have been taken Dr L. J. Bruce Chwatt summed up the knowledge acquired through radioisotopes of the biology of insects which carry diseases or are harmful to crops.

### Entomological research

Various experimental methods have been suggested for introducing radioactive elements into the bodies of insects without impairing their normal functions. Traces of radioactive elements have been added to feeding solutions or blood or injected into animals stung by the insects. Investigators who have worked with the mosquito vector of yellow fever *Aedes aegypti* on which numerous experiments have been carried out prefer the larval bath. The larvae of mosquitos having completed their third instar were kept until the emergence of the adult in a feeding fluid containing radioactive isotopes. The larvae absorb these isotopes easily through the cuticle, the mouth and the anal papillae. Two radioactive elements were chosen, phosphorus 32 and strontium 89. It would have been logical to use calcium since the larvae contain considerable quan-

Bruce Chwatt L. J. (1956) *Bull. W.H.O.* 15: 491

# RADIATION AND HEALTH

The chief atomic radiations from radioactive substances are classified according to their penetrating powers as alpha, beta and gamma rays. Neutrons are a type of sub-atomic particle arising mainly from atomic reactors but also produced by machines such as cyclotrons and can be regarded as similar to the above radiations. Formed in a different way but essentially the same as gamma radiation are X rays. All these ra-

the property of ionizing matter in their path and are often generally called ionizing radiations although strictly the term includes ultra violet radiation as well.

Since the discovery of radium and X rays at the turn of the century the history of ionizing radiation has been marked by the effects on health which have arisen. In the early days of radiology over-exposure to X rays produced radiation dermatitis which sometimes led to ulceration of the skin. In aplastic anaemia, leukaemia and as demonstrated lately leukaemia. It must be remembered however that these ill effects occurred when radiation was administered in almost completely uncontrolled manner. It is now recognized that only a dose received unnecessarily large amounts of radiation. Examples illustrating the adverse effects that have occasionally followed ill-considered radiotherapy in the more recent past are the radiation dermatitis 35 years after radiation to (1) the marked keloid formation as a result of radiation for cancer (2) a dose of oedema of the skin shortly after irradiation for myelofibrosis (3).

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**TABLE 1 FLIGHT RANGE OF VARIOUS SPECIES OF MOSQUITO  
MARKED WITH RADIOISOTOPES**

Species	Country	Number released	Percentage recovered	Maximum flight range (miles)	Radioisotope
<i>Aedes aegypti</i>	Nigeria	276 000	0.11	0.75	P-32 Sr-83
<i>Aedes communis</i>	Churchill Canada	3 million	0.005	1	P-32
<i>Aedes nigromaculis</i>	California USA	400 000	0.12	1.9	P-32
<i>Culex tarsalis</i>	California USA	10 000	?	1	P-32
<i>Psorophora conformis</i> <i>P. discolor</i>	Arkansas USA	5 000	0.03	6	P-32
<i>Anopheles bellator</i>	Brazil	3 000	?	0.5	Th-228

According to Bruce Chwatt  
1 mile = 1.6 km

It was found possible to transmit the virus of yellow fever through radioactive mosquitos and the mean virus content appeared the same as in the control mosquitos. By marking the viruses themselves attempts are being made to clarify certain problems relating to virus transmission by insects.

#### Action of insecticides

Radioactive tracer techniques combined with paper chromatography have already given promising results in the study of the biochemistry of the resistance of insects to insecticides. It was found that in the resistant house fly more than half the DDT absorbed was degraded to an ethylene derivative whereas in the normal fly the insecticide was unchanged. Moreover in 48 hours the normal flies absorbed about 50% of the DDT whereas the resistant flies absorbed only 6%. Using DDT marked with radioactive carbon some investigators have recently shown that the resistance results from a combination of

several factors: reduced penetration of the toxic substance through the cuticle, slower internal distribution, higher speed of degradation and excretion, and finally an unknown protective factor which decreases the toxicity of the insecticide even when it is applied direct to the nervous ganglia.

By this method it was also possible to observe the fate of DDT sprayed on crops. Bromine labelled DDT analogue was sprayed on wheat grain which was subsequently milled, made into bread and fed to animals. About a quarter of the insecticide was found in the bread but only very small quantities of DDT metabolite were detected in the excreta of the animals.

Lastly the study of the physico-chemical qualities of insecticides and the mechanical properties of sprayers will also benefit from these new techniques. By the addition to insecticides of radioisotopes with a high gamma energy the dispersion patterns and effectiveness of aerosols sprayed from aircraft can be accurately assessed.

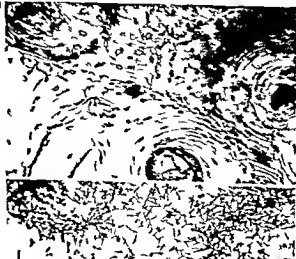
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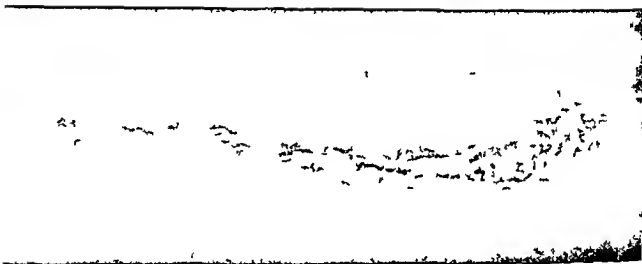
Lastly the study of the physico-chemical qualities of insecticides and the mechanical properties of sprayers will also benefit from these new techniques. By the addition to insecticides of radioisotopes with a high gamma energy the dispersion patterns and effectiveness of aerosols sprayed from aircraft can be accurately assessed.

Industrial radium poisoning was observed in the early 1920s in mous-dial painters who had been in the habit of painting the brushes charged with a diluted radium compound. A long latent period of a number of these workers afflicted with necrosis of the jaw was a form of aplastic or osteosarcoma. The late development of bone or osteosarcoma has also been observed in a few individuals who had been given small doses of radium by injection or orally. Photomicrographs were taken of a bone (4) from one of these cases, a woman who died from a bone tumor in 1951—22 years after the therapeutic administration of radium. The bottom photomicrograph was obtained by developing a thin sheet of photographic film that had been affixed to the section of bone in bone. The tracks of alpha particles from the radium in the bone are visible as short needle-like streaks in the film in other words an autoradiograph was produced. It should be noted, when considering the effect of the ingestion of different radioisotopes by the body that the absorption and retention of each element differs.

In fact on the chemical affinities of the particular radionuclide. An autoradiograph of a section of the leg bone (5) of a dog which died a half year earlier had been treated with radioactive strontium shows both the diffuse and the hot spots (which appear white in the autoradiograph) where the strontium concentrated. A similar autoradiograph of a rat which had been given sodium carbonate labeled with radioactive calcium shows the localization of carbon 14 in both the bone and the bone marrow (6) while another shows the accumulation of a deuterium 2 in the neutral part of its molecule in the bone marrow (7). The different distribution and rate of excretion of different radioisotopes have important bearing on their widely differing toxicity.

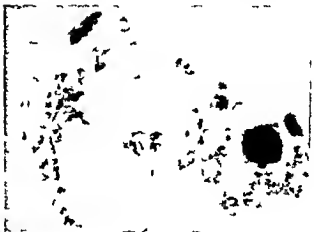
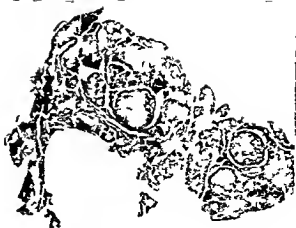


The important positive contribution of radioisotopes to medicine research diagnosis and therapy—probably the most important—has become a matter of national and international interest. For example the WHO Study Group on Endemic Goitre which met in 1957 discussed the use of radioiodine in the investigation of thyroid disease. A section on and a radiograph from a sample in the thyroid gland (8) clearly illustrates the value of autoradiography as a research tool. The radiograph obtained after administration of a trace dose of radioiodine demonstrates very clearly that the iodine concentration in the thyroid gland of a patient (9) provides easy means of testing the activity of the gland. Determination of the wrist-to-wrist circulation time by means of radioiodine is a useful diagnostic technique. Radioiodinated human serum albumin is injected into one wrist and the counter placed over the other (10). As to the therapeutic use of radioisotopes the running of radioactive colloidal gold into a patient's plural cavity is an interesting example (11). The larger amount of radioisotope used in therapeutic procedures makes it necessary for more attention to be paid to the protection of staff, not the shielded container (11) and the shielded syringe (12) used to administer the penetrating gamma-ray emitting isotopes.



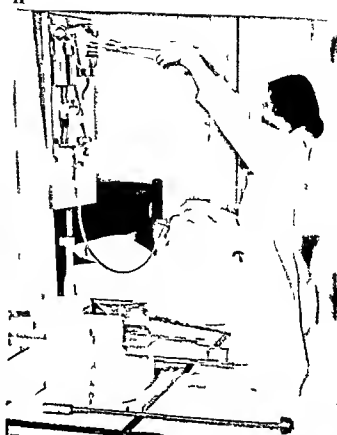
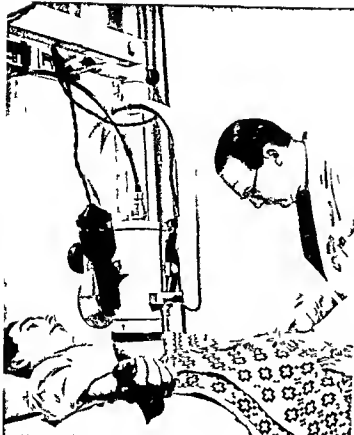
Industrial radium poisoning was observed in the early years in luminous-dial painters who had been in the habit of licking the brushes charged with diluted radium compound after a long latent period a number of these workers were afflicted with necrosis of the jaw a form of aplastic anemia or osteosarcoma. The late development of bone cancer or osteosarcoma has also been observed in a few individuals who had been given small doses of radium, by intravenous or orally. Photomicrographs were taken of a section of bone (4) from one of these cases a woman who died from a bone tumor in 1951—22 years after the radiation administration of radium. The bottom photomicrograph was obtained by developing a thin sheet of photographic film that had been affixed to the section of bone shown above. The tracks of alpha particles from the radium ions in the bone are visible as short needle-like streaks in the film in other words an autoradiograph was produced. It should be noted, when considering the effect of the application of different radionuclides by the body that the contribution and retention of each radioelement differs depending in fact on the chemical affinities of the particular element. An autoradiograph of a section of the leg bone (5) of a dog which eight and a half years earlier had been injected with radioactive strontium shows both the diffuse distribution and the hot spots (which appear white in the autoradiation) where the strontium is concentrated. A similar autoradiograph of a rat which had been given sodium carbonate labelled with radioactive carbon shows the position of carbon 14 in both the bone and the bone marrow (6) while another shows the accumulation of radioactive carbon 14 in the central part of its molecule in the bone marrow (7). The different distribution and rates of excretion of different radionuclides have a prominent bearing on their widely differing toxicity.

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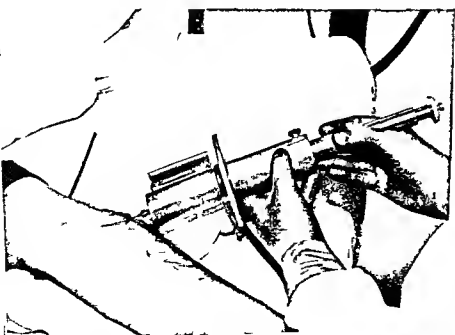
The valuable positive contribution of radioisotopes to medical research diagnosis and therapy—probably in that order of importance—has become a matter of national and international interest. For example the WHO Study Group on Endemic Goitre which met in 1952 discussed the use of radioiodine in the investigation of thyroid disease. A section of the autoradiograph from a simple multi-lobed goitre (8) clearly illustrates the value of autoradiography as a research tool. The autoradiograph obtained after administration of a tracer dose of radioiodine demonstrates very clearly that the iodine-concentrating activity of the gland is confined almost entirely to one nodule. Measurement of the uptake of a tracer amount of radioiodine by the thyroid gland of patients (9) provides a very means of testing the activity of the gland. Determination of the wrist-to-wrist circulation time by means of radioiodine is another useful diagnostic technique. Radioiodinated human serum albumin injected into wrist and the counter is placed over the other (10). As to the therapeutic use of radioisotopes the running of radioactive colloidal gold in patients with pleural cavity is an interesting example (11). The larger movements of radioisotope used in therapeutic procedure make it necessary for more attention to be paid to the protection of staff, note the shielded container (12) and the shielded syringe (13) used to administer the penetrating gamma-ray emitting isotopes.

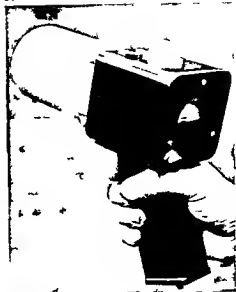


During the last few years radioactive substances have come to be increasingly used in industry. For instance the thickness of a sheet of material can be measured by means of an instrument containing a radioisotope (13). The widespread industrial exploitation of radiation has naturally raised the question of the protection of the workers—a subject in which WHO jointly with the International Labour Organisation is greatly interested. In atomic-energy establishments far larger amounts of radioactive substances are handled than in any other industry and the excellent health record of the employees in such establishments shows what can be achieved in the way of protection through the limitation of radiation exposure to permissible levels. The first essential in a protection programme is therefore to have adequate devices for measuring radiation. These may be either a portable instrument such as the pocket dosimeter (14) or some device that is worn continually—for example a film badge which can be attached to each worker's clothing and developed at the end of a week or some other fixed period. Film badges give a good record of the total beta and gamma-ray exposure of an individual over a period but they have the disadvantage that they cannot be read at intermediate intervals to determine

how much radiation has been received. For this purpose pocket dosimeters of about the size of a fountain pen are useful (15). Measures are not only needed for protection against the rays from sources of radioactivity; precautions must also be taken against small quantities of actual radioactive dust in the air. An apparatus is therefore required for filtering-off some of this dust from the atmosphere and measuring its radioactivity. It is also important to have an instrument such as the hand and foot monitor (16) to register the presence of radioactive dust on the hands of an employee before he goes off work or takes a meal. Equal checks must be made on floors, benches, etc. to prevent spread of radioactive contamination (17). Obviously too even small scratches and cuts received at work must be carefully monitored for radioactivity. (Note the routine film badge hanging from the pocket flap of the middle figure in photograph

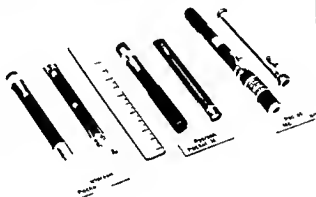
For much laboratory work, particularly that connected with radioactive substances





only alpha ray which has extremely slight penetrating powers shielding is not necessary but the materials must be most carefully enclosed to prevent radiation from leaking out. For such purposes what is known as a dry box (19) used the box is kept at atmospheric pressure so that all leaks are prevented and the materials are handled through the medium of long tubes let into the sides of the box. After some types of work change of clothing is a necessary routine (20). The normal processing of high activity materials is so laborious that it can be done by remote control (21) and a number of various devices have accordingly been invented. For

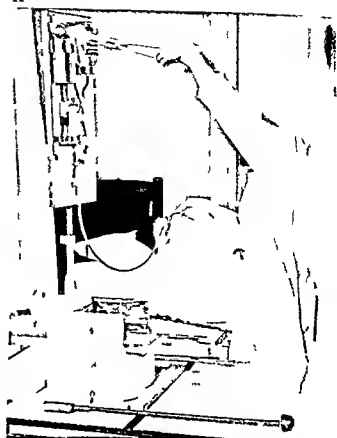
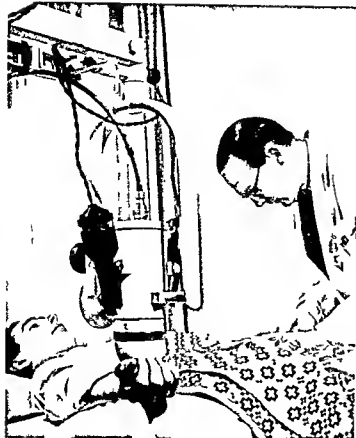
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workers who have to enter areas that are highly contaminated with radioactive dust two types of pressurized suits with an air line and a breathing apparatus have been devised (22). It should, of course, only rarely be necessary to use such clothing. It must be remembered that at all times also precautions have to be observed in every case since some of the radioisotopes are less dangerous than others. Each case should be judged on its own merits or in accordance with a national code of practice.

The transport of small quantities of radionuclides is a comparatively simple affair, a photographic film being carried nearby usually being the limiting factor. For large quantities, however, such as are used as cobalt 60 therapeutic sources, very heavy shielded containers are necessary (23).

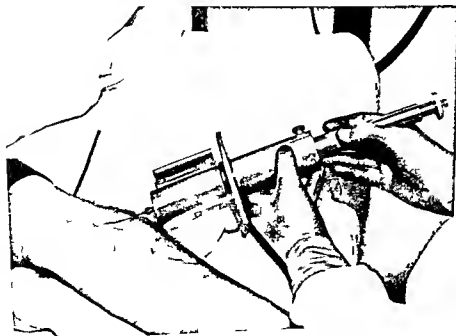
Many of the consequences of radiation, such as radiation sickness, are characterized by the fact that there is a threshold below which radiation has no effect. This does not seem to be the case, however, with the genetic effect. It is thought that however small the dose of radiation, there is some slight probability of a result, a slight increase in the mutation rate. In view of the public health interest aroused by conclusions of this sort, WHO recently convened a study group to consider the results of research on the effects of radiation on human heredity and to produce a small symposium of papers on this subject.

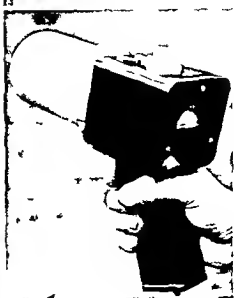
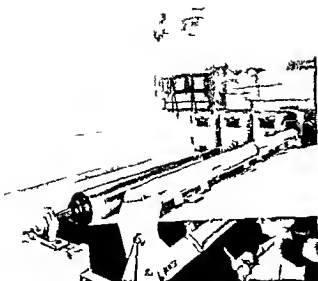


During the last few years radioactive substances have come to be increasingly used in industry. For instance the thickness of a board can be measured by means of an instrument containing a radioisotope (13). The widespread industrial exploitation of radiation has naturally raised the question of the protection of the workers—a subject in which WHO jointly with the International Labour Organisation is greatly interested. In atomic-energy establishments far larger amounts of radioactive substances are handled than in any other industry and the excellent health record of the employees in such establishments shows what can be achieved in the way of protection through the limitation of radiation exposure to permissible levels. The first essential in a protection programme is therefore to have adequate devices for measuring radiation. These may be either a portable instrument, such as the portable monitor (14) or some device that is worn continually—for example a film badge which can be attached to each worker's clothing and developed at the end of a week or some other fixed period. Film badges give a good record of the total beta and gamma-ray exposure of an individual over a period, but they have the disadvantage that they cannot be read at intermediate intervals to determine

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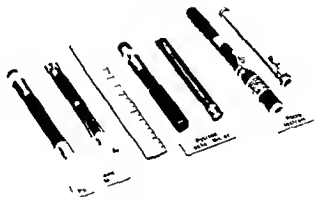
For much laboratory work particularly that connected with radioactive substances





only alpha rays which have extremely slight penetrating powers shielding is not necessary but the material must be most carefully closed to prevent dust from leaking out. For such purposes, what is known as a dry box (19) is used. The box is kept at atmospheric pressure so that all leaks are inward. Items are handled through the medium of long tubes into the sides of the box. After some types of change of clothing is a necessary routine (20). The special processing of highly active material is also carried out by remote control (21) and a number of such devices have accordingly been invented. For

34



workers who have to enter areas that are highly contaminated with radioactive dust two types of pressurized suits with an air line and breathing helmet are used (22). This kind of course is only rarely necessary to use such clothing. It must be remembered that not all radioactive isotopes have to be observed in every case. Since some of the radioactive isotopes are less dangerous than others, each case should be judged on its own merits in accordance with a national code of practice.

The transport of small quantities of radioactive isotopes is a comparatively simple affair. Photographic film being carried nearby usually being the limiting factor. For large quantities, however, such as are used in cobalt 60 and other therapeutic sources, very heavily shielded containers are necessary (23).

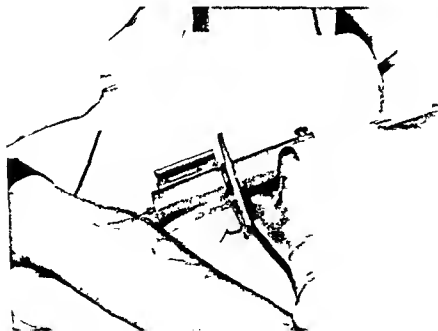
Many of the consequences of radiation on such as radiation sickness are characterized by the fact that there is a threshold below which radiation has no effect. This does not seem to be the case however with the genetic effects. It is thought that however small the dose of radiation there is some slight probability of a resultant increase in the normal mutation rate. In view of the public health interest aroused by conclusions of this sort, WHO recently convened a study group to carry out future lines of research on the effects of radiation on human heredity and to provide a small symposium of papers on this subject.

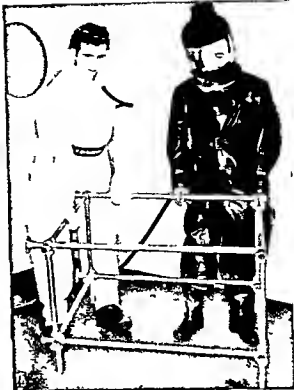
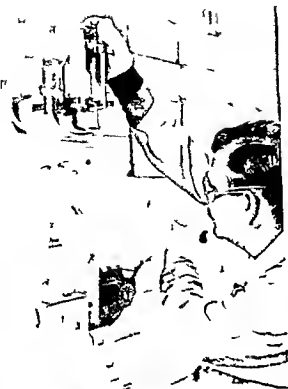






During the last few years radioactive sulphur per board can be measured by means of a radiation has naturally raised the question of the International Labour Organisation is greatly interested in the problem and the excellent work done in the way of protection through the limitation of exposure is therefore to have adequate devices for measurement (14) or some device that is worn continually—so that the dose can be developed at the end of a week or some other fixed period of exposure of an individual over a period but they have the disa-





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The MRC report also stated that the upper limit of future knowledge may set the dose of exposure at which may be received by population as a whole is not likely to be more than twice the dose which is already received from the natural background, the recommended figure may indeed be appreciably lower than this. A somewhat similar conclusion was reached in the recent report of the National Academy of Sciences (see ref. 1).

Although only a very small minority of the population, generally, effects are less of a limiting factor in considering maximum permissible level of radiation can be received. Such occupational levels as well as suggestions regarding population doses have been laid down by the International Commission on Radiological Protection, a non-governmental body in official relationship with WHO. The Recommendations of the Commission (see ref. 3) fix maximum permissible levels both for external radiation and for concentrations of different radioisotopes in food and water. They also supply a considerable amount of other useful information on radiation protection.

There is a need for training in the new science of radiation protection which has grown up to tackle these problems. The first international training conference for health physicists, which was held at Stockholm in 1955, was sponsored by WHO in co-operation with the Swedish Government and the US Atomic Energy Commission, while lecturers came from a number of countries.

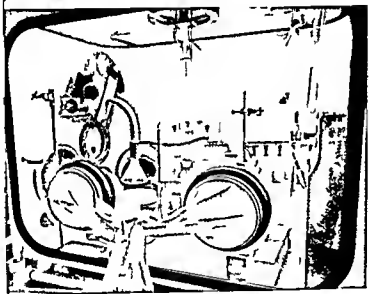
1955 was sponsored by WHO in co-operation with the Swedish Government and the US Atomic Energy Commission, while lecturers came from a number of countries.



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ge 237 of this publication the reader will find a review of the valuable information that stemmed from the meeting of this study group. Genetic changes after irradiation can be divided into chromosome breaks which are relatively easily demonstrated cytologically and point mutations. Chromosome breaks can be seen in the cells of the broad bean after exposure to X rays (24). (a) shows a broken chromosome (b) a dividing cell with a "bridge and fragment" derived from a chromosome break (c) and (d) chromosomes excluded from the two new cells. As these gross abnormalities occur more at high dosage and are likely to lead to embryological death or to reduced fertility interest in human genetics is focused more on point mutations. Such mutations are radiation have been clearly demonstrated in fruit flies (25). For this type of illustration of course the more easily recognized mutations are selected and this has led sometimes to the fallacy that "monsters" might be produced in man. This is not the just a conception; he thinks rather of an increase in the known hereditary diseases since in experimental work no new mutations are produced which do not occur in nature. As most visible mutations are recessive the total effect of an increase in mutation only appears over many generations. The effect on an irradiated individual's children is likely to be minimal in fact for levels of radiation up to the [mutation] doubling dose and even some way beyond the genetic effects of radiation are only appreciable when reckoned over the population as a whole and need cause no alarm to the individual on his own account" (see ref. 1). Genetic changes in the average dose to the whole population is the important figure to keep down, so that the natural background radiation from outer space from radioactive material in the earth's crust and from the natural radioactive elements in his own bone and flesh has been exposed to all through evolution shall not be unreasonably increased. The additional radiation of genetic interest which one population (that of England and Wales) was being subjected to is listed in the table on page 254 which has been taken from the report of a committee established by the Medical Research Council for Great Britain (ref. 1).

## DISPOSAL OF RADIOACTIVE WASTE

As long as nuclear energy is produced by the disintegration of heavy elements like uranium the disposal of the waste products from the fission process will be a matter of concern to public health authorities. Industries using this form of power plants where uranium is enriched in its fissionable isotope and research reactors as well as hospitals and laboratories using radioisotopes produce waste which itself gives off radiation. If such waste were allowed to accumulate unchecked it would soon become a menace to public health. Although fission liberates large amounts of energy the fission products are about equal in mass to the original uranium, only a very small part of the mass is converted into energy. Even if every effort is made to recover the useful elements it is hardly likely that it will be possible to find a use for all the by products of the nuclear industry when atomic power is utilized in many countries. The problem of waste will remain. It is not even out of the question that it will become a factor which will limit the rational intensive production of this form of energy. Even now to some extent waste disposal considerations influence the choice of site for plants and generators. Methods of disposing of waste cannot be simple and uniform for the residues are not homogeneous. Fission takes place in a variety of ways so that a large number of isotopes belonging to about 30 elements are formed. Almost all of these are radioactive and having half life periods ranging from a few seconds to several decades. Affinities for different organs of the human body and very different penetrating powers they represent various degrees of danger.

Several methods for the disposal of radioactive waste have been devised and are already being used on a wide scale in production and research centres. These methods were developed in accordance with the safety standards laid down by the national author-

ities responsible for the production of atomic energy and by the International Commission on Radiological Protection.

In an article which appeared recently in the *Bulletin of the World Health Organization*<sup>1</sup> A. W. Kenny gave a general description of these methods for the guidance of sanitary engineers on whom will fall part of the responsibility for radioactive waste control. The following information is taken from this paper and from its reference sources.

### THE EFFECT OF RADIATION

None of our senses warns us of the presence of radiation in our environment since we feel no immediate pain—except of course if serious burns have been sustained from intense sources of radiation. It is often only after months or years that lesions which may be serious or even fatal are noticed.

In discussing the dangers of radiation to the human organism it is often forgotten that from his earliest days man has been bombarded by cosmic rays by radiation from the earth's crust due to the radium, thorium and potassium present and lastly by radiation from his own body principally due to the radiopotassium in the tissues. The amount of external radiation received depends on altitude and latitude. At sea level it is estimated at 0.03 roentgen (r)<sup>2</sup> per year but it may be as much as 0.45 r at an altitude of 6000 metres. It also depends on geological structure being more abundant in granites than in sedimentary rocks. Springs particularly those in volcanic areas may contain comparatively large amounts of radon, an emanation of radium. Sea water contains about the same amount of radium as surface water.

<sup>1</sup>Kenny A. W. (19 6) *Bull. Wld Hlth Org.* 14, 1007.  
<sup>2</sup>One roentgen represents an energy absorption of 93 ergs per gram of body tissue.

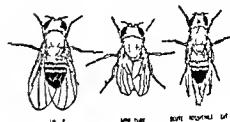
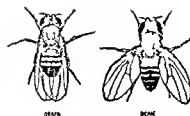
Summary of estimated population doses of radiation to the gonads expressed as percentages of natural background

Source of radiation

Appo at d t gon d  
f at lb kg d

Natural background	100
Diagnostic radiology	at least 22
Radiotherapy	?
Shoe fitting	0.1
Luminous watches and clocks	1
Television sets	much less than 1
High altitude flying	insignificant
Occupational exposure	
Radiology and industry	at least 1.6
Atomic Energy Authority	0.1
Fall out from test explosions	less than 1

R prod d f om Th H ad t M f n l a d All d R d t m  
p 59 (ee r f t) by kind p mis on of the M d c l Rese h Co l of  
G eat Br it n



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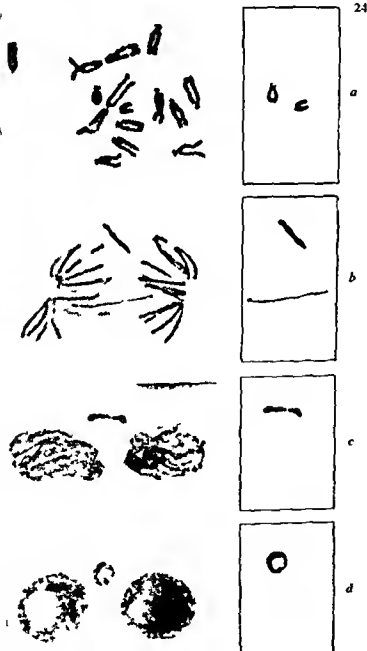
REFERENCES

- 1 Great Britain Medical Research Council (1946) *The hazards to man of nuclear and allied radiations* London
- 2 United States of America National Academy of Sciences (1956) *The biological effects of atomic radiation: summary reports* Washington DC
- 3 International Commission on Radiological Protection (1955) *Brit J Radiol Suppl* 6

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The World Health Organization gratefully acknowledges the valuable co-operation of the following institutions publishers and authors who have kindly made illustrations available for this article

- A C Allen (1954) *The Skin A Clinical-pathologic Treatise* The C V Mosby Company (1 2 3) Argonne National Laboratory (4 5) J Schubert and the Argonne National Laboratory (6 7) Selwyn Taylor (8) United Kingdom Atomic Energy Authority (9 10 13 14 15 17 19 22) United States Atomic Energy Commission (11 12 16 18 20 21) Z M Bacq & P Alexander (1955) *Fundamentals of Radiobiology* (24) A H Sturtevant & G W Beadle (1940) *An Introduction to Genetics* W B Saunders Company (25)





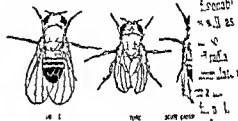
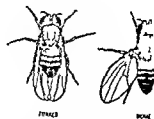
Summary of estimated population doses of radiation to the gonads expressed as percentages of natural background\*

 $S$  of  $R$  is

App x m t d s t x d  
as a p r t e  
f i u l b a l g u d

Natural background	100
Diagnostic radiology	at least 22
Radiotherapy	?
Shoe fitting	0.1
Luminous watches and clocks	1
Television sets	much less than 1
High altitude flying	insignificant
Occupational exposure	
Radiology and industry	at least 16
Atomic Energy Authority	0.1
Fall out from test explosions	less than 1

Produced from T1 H and M f A l r e a d A l l d R d H  
p 59 (see ref 1) by kind p r m i s s i o n f t h M d l R e s a r c h C u l o f  
Gr at B t a n



## REFERENCES

- 1 Great Britain Medical Research Council (1956) *The hazards to man of nuclear allied radiations* London  
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The relation between the production of atomic energy and the disposal of the waste arising from it has been clearly expressed in one of the papers presented at the International Conference on the Peaceful Uses of Atomic Energy held in Geneva in 1955 which included in its agenda the problem of the disposal of fission products. In the paper in question <sup>1</sup> Dr L. Glueckauf of the Atomic Energy Research Establishment Harwell, England made the following observations which may serve as a conclusion to this article.

"In order to appreciate fully the fission product problem it is necessary to estimate the possible expansion of nuclear energy production.

The British atomic energy program envisages in the foreseeable future a substitution of nuclear energy for approximately 60 million tons of coal which would otherwise annually be burnt for production of electricity towards the end of this century. In order to do this it would be necessary to burn up approximately 20 tons of nuclear fuel annually.

"From the British requirements one can estimate that world consumption of nuclear fuel may eventually reach figures of not less than 200 tons annually. On the other hand it is unlikely that a world consumption of 1000 tons will be exceeded in the foreseeable future as this would imply an electricity consumption per head of the world population equal to the present USA level and derived essentially from nuclear energy. From the point of view of the fission product nuisance a world level of 1000 tons annually in the distant future is thus the most pessimistic outlook we can reasonably accept today. This level of nuclear energy would be equivalent to twice the present world coal production estimated at 1500 million tons of coal. If therefore we can decide on ways and means to dispose economically and without danger to ourselves and future generations of a quantity of fission

products of this order we shall have no need to restrict later on the expansion of nuclear industries on account of the fission product nuisance."

## SUMMARY OF RADIOACTIVE DISCHARGES

### A Gaseous and Particulate Wastes

- 1 *Air cooled plant discharging gaseous and particulate wastes*

Discharge to atmosphere through tall stacks after filtration of particulate matter. Constant monitoring of surroundings. Gases may be scrubbed.

- 2 *Pool type reactor*

Negligible discharge except with homogeneous reactors which incorporate the re-own fuel processing plant and need same precautions as (3) below.

- 3 *Fuel processing plants*

Discharge to atmosphere through tall stacks. Fuel is allowed to cool for a sufficient period to allow decay of radioactive particulates. Gases are usually scrubbed. Constant monitoring of surroundings e.g. grass, soil, animals.

- 4 *Land treatment of waste*

Disperse to atmosphere through stacks after filtration.

- 5 *Underground disposal plant*

Negligible discharge.

- 6 *Laboratory and medical establishments*

Disperse to atmosphere at roof level or above sometimes with filtration.

- 7 *Incineration*

Disperse to atmosphere usually without filtration.

- 8 *Hot plants discharging fission products*

Negligible.

### B Liquid Wastes

- 1 *Water-cooled plant discharging gaseous and particulate wastes*

Cooling water is pre-treated to remove elements which become very radioactive under neutron bombardment. Discharge to river or sea after short detention to allow decay.

- 2 *Pool type reactors*

Negligible except with homogeneous reactors (see (3) below).

- 3 *Fuel processing plants*

(1) Very active small volume waste containing bulk of fission products, stored permanently after volume reduction by evaporation or other methods.

<sup>1</sup> Glueckauf, L. E. (1956) Long term aspect of fission product disposal. In: *Proceedings of the International Conference on the Peaceful Use of Atomic Energy*, New York, 689 p. 3.



mud and sand and by fish and shore life. Bathers and people walking on the shore or eating fish shellfish or vegetables fertilized by seaweed are thus the people whose protection must be assured. Although experience has shown that the doses of radiation received in this way from the discharge of low level waste are very much lower than the permitted limits it is not possible to discharge high level liquid waste to sea and long term storage in small bulk must be the method to be adopted. Techniques have been devised for reducing the volume of liquid wastes by evaporation precipitation or ion exchange. This makes it possible for such wastes to be disposed of in the form of sludge by the methods described later.

The second type of waste—the high activity low volume material—is the most dangerous and raises the more difficult disposal problems. Such wastes arise in fuel processing plants when the spent uranium is replaced by fresh uranium and they contain the whole range of fission products. Of these caesium 137 and strontium 90 are the most dangerous from the long term point of view: the first because its half life period is particularly long (33 years) and the second because apart from having a long half life (28 years) it settles preferably in the bones from which site it is only excreted extremely slowly. The present method of disposal of high activity low volume wastes is permanent storage in well shielded tanks.

### *Solid wastes*

When liquid wastes are concentrated as sludge they are in effect solid wastes and can be dealt with as such. The highly active solid wastes being potentially very dangerous must be disposed of in such a way that they do not come into contact with living organisms or ground water. For this reason they are often stored in watertight steel lined concrete tanks which are buried deep in the earth or otherwise shielded against the intense radioactivity. Slightly contaminated non combustible material such as glassware may also have to be buried under con-

trolled conditions or put into containers and dumped in the deep ocean.

For destroying contaminated combustible waste (paper clothing laboratory material) from hospitals and research laboratories incinerators are used. It has been suggested that the ash which contains most of the radioactivity should be incorporated in melts to prevent it from being blown about and thus presenting a hazard. It is important that no material should be salvaged for pulpine. Cases have been known where delicate physical measurements have been upset as a result of the unsuspected presence of material made from solid waste contaminated with radioactive elements.

### FURTHER RESEARCH INTO RADIOACTIVE WASTE DISPOSAL

It will be seen that methods of radioactive waste disposal can be divided essentially into two types: dilution of radioactivity into insignificance or concentration and storage. As regards the latter permanent storage would be much facilitated if the waste could be concentrated into a completely insoluble form.

For example some types of montmorillonite clay are able to act as ion exchangers and absorb most of the radioactive elements irreversibly when heated to 1000°C. Ruthenium which is not absorbed by this clay to any appreciable extent can be separated from it and treated by fusion in glass or ceramic material. The roasted clay in which the radioactive substances have been concentrated can be stored or buried in the ground for a long period without losing any of its absorbed elements through the action of either fresh or salt water. In other words there is no danger of ground water contamination. At any rate on the basis of the results observed after several months storage it seems reasonable to draw such a conclusion. The method has already been used on a semi industrial scale and is being explored further because of its many advantages.

• • •

radiation and radioactivity certain forms of artificial irradiation

Natural irradiation is due to

(1) Cosmic radiation

(2) Background " gamma radiation from radioactive substances present locally in the earth rock or building materials and from disintegration products of radon in air

(3) Radiations emitted from natural radioelements such as potassium 40 radium radon and carbon 14 which are incorporated in the body

The amount of this natural radiation varies with locality but has been estimated as usually delivering between 70 and 170 mremms per year to the gonads. Of this total the major contributions are of about 45 from local gamma radiations 30 from cosmic rays and 20 from body potassium 40.

Artificial irradiation is derived from

(1) The contamination of the environment the atmosphere or water by radioactive waste from atomic industries or from users of radioelements

(2) The radioactive fallout at greater or lesser distances from the source or radioactivity resulting from the explosion of nuclear devices

(3) The occupational exposure of certain groups of workers medical practitioners radiologists dentists nurses atomic energy workers uranium or thorium miners and the industrial or scientific users of radiation generators or radioactive isotopes

(4) The medical use of X rays other ionizing radiations and radioelements in the detection diagnosis investigation and treatment of human diseases

(5) The use of certain devices which emit radiation such as television receivers watches with luminous dials and the X rays generators used for the purpose of fitting shoes

The amount of artificial radiation must vary considerably in different countries and we have inadequate information as to the

over all significance of these factors. In certain countries where estimates have been made it appears that the greatest gonad irradiation of the population is due to diagnostic radiological procedures the amount from this source about equalling that from all natural sources in certain instances. The total present contribution from occupational exposure from the products of atomic industries from radiotherapy and from the radiating devices mentioned above is likely to be considerably smaller. That from radioactive fallout to the gonads appears at present to be in the region of 1/ of the natural gonad irradiation in most areas.

Both the magnitude and the significance of these various sources are under review by the Committee. Since medical irradiation accounts for a substantial if not the major proportion of all artificial exposure it is important that its magnitude should be known accurately for different countries and circumstances. The possibility of making such an assessment depends upon the help of the medical profession and particularly on the adequacy and availability of records kept by doctors dentists and organizations responsible for the use of ionizing radiation.

### Radiation hazards

The medical use of radiation is clearly of the utmost value in the prevention diagnosis investigation and treatment of human disease but the possible effects of this irradiation of individuals require examination.

Generally speaking the irradiation of living beings may produce radiobiological effects either on the irradiated individual himself or through him, on his descendants the former being termed somatic and the latter genetic effects. Somatic effects vary according to the different organs or tissues affected and range from slight and reversible disturbances such as cutaneous erythema to the induction of leukaemia or of other malignant diseases. The possible reversibility of the somatic effects of radiation

From report sent to the U. S. and the U. K. and the U. S. States of America.

According to the report sent by the United Kingdom and the United States of America.

Methods of absorbing or incorporating in solids are actively being investigated. Disposal to ground is also under investigation. Removal of radio caesium and radiostrontium by chemical precipitation would leave a relatively fast decaying waste which might be disposed of as low activity waste after 10-15 years.

(b) Some medium activity wastes have been discharged to ground. A site is used till underground water is just detectably contaminated.

(c) Low activity high volume wastes may be discharged to sea after treatment by conventional coagulation.

4 *Uranium recovery from ores and uranium-enrichment plants*

Discharge to river after treatment for uranium recovery.

5 *Laboratories at atomic energy establishments*

Discharge to rivers after treatment by coagulation.

and settling. Some waste may have to be stored but it is usually of quite small volume.

6 *Hospitals and users of isotopes*

Discharge to sewers or rivers without treatment except for discarded "closed" sources.

C Solid Wastes

1 *Sludge from liquid waste treatment*

Drum and dump at sea.

2 *Contaminated equipment from atomic energy establishments*

Suitable items may be dumped at sea. Combustible material is burnt. The rest is stored permanently.

3 *Hospitals and users of isotopes*

Combustible material is burnt e.g. in hospital incinerator. Solid waste is normally not unduly active and could be buried at municipal dump. It is important to avoid salvage.

## RESPONSIBILITIES OF THE MEDICAL PROFESSION IN THE USE OF X-RAYS AND OTHER IONIZING RADIATION

*The statement reproduced below was prepared by the United Nations Scientific Committee on the Effects of Atomic Radiation. Although it is addressed primarily to those who control in whatever capacity the medical and occupational radiation of man, the statement is likely to be of topical interest to the public health worker.*

The United Nations General Assembly being aware of the problems in public health that are created by the developments of atomic energy established a Scientific Committee on the Effects of Atomic Radiation. This Committee has considered that one of its most urgent tasks was to collect as much information as possible on the amount of radiation to which man is exposed today and on the effects of this radiation. Since it has become evident that radiation due to diagnostic radiology and to radiotherapy constitutes a substantial proportion of the total radiation received by the human race the Committee considers it desirable to draw attention to information that has been obtained on this subject.

Modern medicine has contributed to the control of many diseases and has substan-

tially prolonged the span of human life. These results have depended in part on the use of radiation in the detection, diagnosis and treatment of disease. There are however few examples of scientific progress that are not attended by some disadvantages, however slight. It is desirable therefore to review objectively the possible present or future consequences of increased irradiation of populations which result from these medical applications of radiation.

### General survey of the irradiation of human beings

Man has always been exposed to some irradiation from natural sources. To this has now been added as a result of modern discoveries and the applications of ionizing

using radiographic or fluoroscopic equipment (c) by any local shielding of the gonads that is practicable especially during abdominal or pelvic examination (d) by the use of techniques involving radiography rather than fluoroscopy when full information can be obtained by this means (e) by improvement of administrative arrangements designed

to obviate unnecessary repetition of identical examinations of the same subject, (f) by a general study of certain medical conditions such as that of peptic ulcers to identify the circumstances in which the establishment of a radiological diagnosis has or has not a definite influence upon the treatment or prognosis given

## Notes and News

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### Portable instrument for comparing national X ray standards

To compare radiation results obtained in clinical and research institutions throughout the world a uniform yardstick for measuring radiation is necessary. Some countries now maintain standard instruments for the calibration of the instruments used in radiation centres others are preparing such standards. Often however these standard instruments are too fragile and too bulky for shipment so that direct comparison is difficult. To overcome this difficulty the United States National Bureau of Standards has constructed a small portable ionization chamber capable of great accuracy. Accessory equipment includes a gamma ray source and fixed geometry for checking the calibration constancy of the small chamber and a set of calibrated diaphragms and capacitors for comparing with those of the national standard.

UNESCO, WHO and the United States National Bureau of Standards are planning to make this instrument available on temporary loan to any country upon request. UNESCO is providing the requisite funds for the purchase, maintenance and transport of the equipment while WHO will furnish the technical expert whose duty it will be to demonstrate its use. Standardization by means of such an instrument has been endorsed by the International Commission on Radiological Units and Measurements and also by the United Nations Scientific Committee on the Effects of Atomic Radiation

It is of importance that the roentgen unit of radiation should be the same in each country not only for the purpose of comparison of therapeutic X ray doses but in view of the interest at the present time in doses received by whole populations from diagnostic X rays to ensure that surveys of doses received from such X rays are also comparable in different countries. From the point of view of radiation biology it is most important that experimental X ray doses are comparable and the same applies to many other scientific uses of X rays.

WHO has been interested in these problems since a Study Group on Radiological Units and Radiological Protection was arranged by the Organization in April 1956. This group made recommendations for WHO's consideration on a wide range of subjects including X ray and radioisotope standards, training in radiation protection work and the medical use of radioisotopes and radioactive waste disposal. More specifically however the recommendations led to the present plan which harmonizes well with WHO's work of biological standardization in other therapeutic and diagnostic fields.

### Conference on Research uses of Radioisotopes

Following a preliminary meeting of experts from eight countries held in Paris from 14-15 January 1957 UNESCO is organizing an International Conference on the Utilization of Radioisotopes in Scientific Research

received in small doses or at low dose rates encourages the belief that there are permissible doses of radiation which will not cause completely irreversible or significant somatic damage. The threshold for occasional somatic damage may however prove to be low. In the case of genetic effects on the other hand there may be no threshold. These effects increase with a frequency corresponding to the total amount of radiation received by the germinal tissues and in the great majority of cases are adverse.

Many other factors complicate the interpretation of radiobiological effects. The differences between whole and partial body radiation between a single exposure and continuous irradiation or between the effects of different types of radiation are still imperfectly understood. Biological differences in the radiosensitivity of various tissues or of the tissues of people of different age or sex obviously influence the nature of radiation hazards. It is clear however that any radiation of gonads and any substantial irradiation of other tissues involve a chance of significant damage which requires assessment.

### General recommendations

The radiological profession through the International Commission on Radiological Protection<sup>3</sup> has undertaken a valuable and responsible duty in defining maximum permissible limits of exposure for the main radiation hazards.

The establishment of these maximum permissible levels for those who are occupationally exposed to radiation depends on the view that there are doses which in the light of our present knowledge do not cause detectable somatic injury in the individual irradiated, and on the consideration that the number of individuals concerned is small enough for the genetic effects on the whole population to be negligible. For the gonads or for irradiation of the whole body, the

levels are such as to exclude doses greater than 0.3 rem in any week or 3.0 rem in any 13 weeks or a sustained irradiation rate greater than 5 rem per year. These values imply that no total dose of over 50 rem will have been received by the gonads by the age of 30 or of over 200 rem by the whole body by the age of 60 in any occupationally exposed person<sup>3</sup>.

As regards irradiation of the whole population it is considered prudent to limit the average dose to germinal tissues from artificial sources to the order of magnitude of that received from all natural sources.

In considering the extent to which the population is irradiated for medical purposes it is essentially the genetic hazard which is involved although it seems possible that in certain circumstances somatic injury may occur occasionally after low doses of radiation arise. Otherwise the relevant dose is that indicating the mean gonad irradiation among the population as a whole up to the end of the average reproductive period.

The extent of such genetic irradiation from diagnostic procedures has been found to be equal to at least 100% of all natural radiation in two countries<sup>4</sup> and that from a third equalled at least 22% of this figure<sup>5</sup>. Even before obtaining more exact values for these and other countries it is clear that the exposure can be substantial in countries with extensive medical facilities and that it is essential to consider any ways in which this exposure could be reduced without detriment to the existing or developing value of medical radiology.

The Committee is therefore anxious to obtain the help of radiologists in suggesting through appropriate governmental channels any methods by which this total exposure could be reduced and in estimating the amount of reduction that might be expected from any such methods. In particular it would be valuable to know how much the radiation to the gonads could be reduced (a) by improved design or shielding of equipment (b) by fuller training of any individuals

See the report of the International Commission on Radiological Protection published in the Bulletin of the International Commission on Radiological Protection, Vol. 1, No. 1, 1954, and the Supplement, 1955.

Swedish text of American  
United Kingdom

## Part I Report of Study Group

### Report of Study Group on the Effect of Radiation on Human Heredity

1. Introduction
  2. Natural and man-made sources of ionizing radiation
  3. Importance of recording radiation exposure in individuals and populations
  4. Research
  5. Some conclusions
- Annex List of participants

## Part II Papers Presented at Study Group

Damage from point mutations in relation to radiation dose and biological conditions—*H. J. Muller*  
Types of mutation at known gene loci and possibility of hitherto unrecognized mutations being induced  
Irradiation of animal populations: results and work needed—*T. C. Carter*

Some of the problems accompanying an increase in mutation rates in Mendelian populations—*Bruce Wallace*

Exposure of man to ionizing radiations, with special reference to possible genetic hazards—*R. M. Seest*  
Detection of induced mutations in offspring of irradiated parents—*J. Lejeune*

Gonad doses from diagnostic and therapeutic radiology—*H. M. Cotten*

Mutation in man—*L. S. Pease*

Possible areas with sufficiently different background radiation levels to permit detection of differences in mutation rates of marker genes—*A. R. Gopal Ayengar*

Comparisons of mutation rates at single loci in man—*A. C. Stenson*

Some problems in the estimation of spontaneous mutation rates in animals and man—*James V. Neel*  
Effect of inbreeding levels of populations on incidence of hereditary traits due to induced recessive mutations—*V. Feil*

Detection of genetic trends in public health—*Harold B. Newcombe*

which will take place also in Paris in the last two weeks of September 1957. The World Health Organization together with the Food and Agriculture Organization, the World Meteorological Organization and the European Nuclear Research Centre is collaborating with UNESCO in the preparatory work for the meeting and is providing for two consultants to give evening lectures on problems of radiation protection.

The Conference aims to bring together more than a thousand experts from all over the world for the purpose of a broad exchange of information on the various uses of radioisotopes in research. The last conference of this nature was held in 1954 at Oxford, England, under the auspices of the United Kingdom Atomic Energy Authority and since then substantial advances have been made notably as regards irradiation techniques for the production of radioisotopes.

The Conference is expected to subdivide into two main groups dealing broadly with the utilization of radioisotopes in research in the physical sciences and in the biological sciences respectively. WHO's chief interest as regards this Conference lies in the use of radioisotopes in basic medical research including work on animal and human physiology and nutrition.

#### Post graduate training in atomic energy

The coming generations of medical and public health personnel must be prepared for

the new responsibilities they will have to assume in the future as a result of the advent of atomic energy. Hence the introduction without delay of radiation biology and radiation medicine into the training of public health workers is a matter of timely importance.

The WHO Expert Committee on Professional and Technical Education is to meet in Geneva from 23 to 28 September 1957 for the express purpose of studying and exchanging experience on this matter and of drawing up a report for the information of public health educators. The members of the group will be Professor Gaylord Anderson (United States of America), Dr John C. Bugher (USA), Professor G. Burger (Netherlands), Professor J. Coursaget (France), Sir Ernest Rock Carling (United Kingdom), Dr C. P. Straub (USA) and Dr Masao Tsuzuki (Japan).

The main subjects of discussion will be knowledge required by various categories of public health workers: nuclear energy teaching in public health courses including preservation and sterilization of food, drugs and biologicals and tracer uses of radioisotopes; contamination; disposal of waste and protection from radiation; organization of the curriculum including formal and practical teaching and short term refresher courses.

The report of the committee will be submitted to the WHO Executive Board at its January 1958 session, subject to approval for publication. It will be printed shortly thereafter in the *WHO Technical Reports Series*.

## Review of WHO Publications

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*Effect of Radiation on Human Heredity*  
*Report of a Study Group convened by WHO*  
*together with Papers presented by Various*  
*Members of the Group. Geneva 1957*  
168 pages

Price £1 \$4.00 Sw fr 12 —

The conclusions and findings of the Study Group on the Effect of Radiation on Human Heredity convened by WHO have been outlined in some detail elsewhere in this issue (page 237). The table of contents of the publication on the subject recently issued by WHO is given below.

## Part I Report of Study Group

Report of Study Group on the Effect of Radiation on Human Heredity

- 1 Introduction
  - 2 Natural and man-made sources of ionizing radiation
  - 3 Importance of recording radiation exposure in individuals and populations
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Mutation in man—*L. S. Penrose*

Possible areas with sufficiently different background radiation levels to permit detection of differences in mutation rates of "marker" genes—*A. R. Gopal Aiyangar*

Comparisons of mutation rates at single loci in man—*A. C. Steinhilber*

Some problems in the estimation of spontaneous mutation rates in animals and man—*James V. Neel*

Effect of inbreeding levels of populations on incidence of hereditary traits due to induced recessive mutations—*N. F. de Mea*

Detection of genetic trends in public health—*Harold B. Neel*



# MEAT HYGIENE

V E ALBERTSEN — R BENOÎT — T BLOM — Phyllis G CROFT  
C E DOLMAN — H DRIEUX — R I HOOD — M J J HOUTHUIS  
A JEPSEN — H H JOHANSEN — M M KAPLAN — S O KOCH  
G SCACCIA SCARAFONI — G SCHMID  
F SCHONBERG — H THORNTON

" Since the dawn of history man has had to match his wits against two four and six legged adversaries in a struggle for existence. Once upon a time when he won these contests he ate as much of his opponent as he could stomach. " Today the idea of eating meat in so crude and indigestible a form is abhorrent to most people with the development of agriculture and animal husbandry however mankind has come to depend increasingly for strength and sinew upon the cooked flesh of tamed herbivores. But the widespread use of such animals for food has brought in its train many problems. Meat is a perishable commodity and its poor handling whether by the slaughterer the retailer or the housewife is likely to result in ill health and wastage. The farmer too has a part to play in providing the consumer with safe and wholesome meat he is responsible for the health and care of the animals before slaughter.

This comprehensive and well illustrated book contains contributions from meat hygiene experts in many parts of the world. Besides dealing with the practical health problems of the meat industry from the ante mortem care of slaughter animals to the hygienic processing and marketing of meat and the sanitary disposal and reclamation of by products it covers such wider aspects of meat hygiene as the epidemiology of meat borne diseases the training of meat inspectors the current meat hygiene practices in a number of European countries and the special meat hygiene problems in the tropics. In addition much detail—on laboratory techniques for the detection of meat borne diseases on meat hygiene regulations in various countries and on design of abattoirs—is given in annexes. The book ends with a useful bibliography classified according to the broad subjects under which the various contributions are grouped.

This monograph includes a number of the papers read at the WHO/FAO Seminar on Meat Hygiene held in Copenhagen in February 1954 as well as a review of the salient features of the discussions. These papers have where necessary been expanded or brought up to date and several new articles have been contributed. The monograph is not intended as a universal guide to meat hygiene its aim is to throw light on recent advances and problems in the many and diverse aspects of this vast subject for the benefit of the responsible authorities and students in public health and in veterinary science.

527 pages 106 illustrations 2 colour plates bibliography index

Price £2 10s. \$10.00 Sw fr 30.— (clothbound)

# MALARIA

## Some WHO publications

### CHEMOTHERAPY OF MALARIA

by Sir Gordon COVELL, G. R. COATNEY, John W. FIELD & Jaswant SINGH  
Monograph No. 27, 1955, 123 pages, 10 figures, 14 tables, bibliography, index  
\$1.76 \$3.25 Sw fr 10.— (clothbound)

*This work by four eminent malariologists constitutes a critical study of the most recent antimalarial drugs. It covers a very extensive field giving a brief general outline of the history of these drugs and examining the question of resistance to antimalarials. Each of the compounds in common use is analysed as to its chemical structure, activity, toxicity, contra-indications, dosage, absorption and elimination and plasma concentration.*

### MALARIA CONTROL

Bulletin of the World Health Organization, 1954, Vol. 11, No. 4-5, 382 pages, 66 figures, 78 tables  
[Articles in English or French with detailed summary in the other language]  
£1 \$3.00 Sw fr 12.—

*This number makes a valuable contribution to the literature on malaria. It describes the new strategy in malaria control since the development in mosquitos of resistance to insecticides—a strategy by which early eradication of malaria over vast regions may be anticipated. The work provides a general picture of the present situation with regard to control by means of residual insecticides illustrating the success and limitation of the method and the problems it gives rise to in many countries and territories. Other articles deal with the ineffectiveness of DDT spraying in the Jordan Valley, the effects of suspended residual spraying and of imported malaria in the USA, the resistance of Anopheles sacharovi to DDT and to chlordane and the possibility of resistance to DDT by Anopheles albimanus.*

### MALARIA TERMINOLOGY

by Sir Gordon COVELL, Paul F. RUSSELL & N. H. SWELLENGREBEL  
Monograph No. 13, 1953, 87 pages, 8 figures  
\$1 \$1.00 Sw fr 4.—

*This work is divided into two parts: (1) a commentary on the terms used by malariologists (excluding terms relating to engineering techniques and insecticide sprayers and the names of antimalarial drugs) and (2) a detailed glossary of those terms.*



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# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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## SCHEDULE OF MEETINGS

23 25 September	Study Group on Chemotherapy and Chemoprophylaxis in Tuberculosis Control Copenhagen
23 27 September	Regional Committee for the Eastern Mediterranean Sub-Committee A Alexandria
23 28 September	Expert Committee on Professional and Technical Education Post graduate Training in the Public Health Aspects of Atomic Energy Geneva
23 September 1 October	Fourth Conference on Nutrition Problems in Latin America (FAO WHO) Guatemala
30 September 5 October	Symposium on the Public Health Aspects of Chronic Diseases Amsterdam
2 8 October	Expert Committee on the International Pharmacopoeia Geneva
7 12 October	Study Group on Recommended Methods and Minimum Requirements on Biological Substances Geneva
7 12 October	Joint FAO/WHO Expert Committee on Brucellosis Lima
13 26 October	Rural Health Conference New Delhi
14 19 October	Expert Committee on Addiction Producing Drugs Geneva
15 October	Regional Committee for the Eastern Mediterranean Sub-Committee B Geneva
16-29 October	Study Group on Social and Preventive Medicine Manila
21 26 October	Committee on International Quarantine Geneva
21 26 October	Study Group on Mental Health Aspects of Peaceful Uses of Atomic Energy Geneva
22 29 October	Joint FAO/WHO Expert Committee on Nutrition Rome
28 October 2 November	Expert Committee on Training of Health Personnel in Health Education of the Public Geneva
4 9 November	Study Group on Ataractic and Hallucinogenic Drugs in Psychiatry Geneva
4 15 November	Seminar on the Nurse in the Psychiatric Team Noordwijk
6-13 November	Conference on Public Aspects of Air Pollution Milan
18 23 November	Expert Committee on Insecticides Geneva
18 23 November	Expert Committee on Air Pollution Geneva
25 30 November	Expert Committee on Professional and Technical Education The Introduction of Radiation Medicine into the Undergraduate Medical Curriculum Geneva
25 November 4 December	Seminar on Veterinary Public Health Warsaw
26 November	Fifth Borneo Inter territorial Malaria Conference Labuan

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## THE 1957 INFLUENZA EPIDEMIC

The influenza epidemic that started in Asia and has spread in a few months to both hemispheres has for several reasons put epidemiologists and health authorities on their mettle

While remaining mild it has a tendency to spread that is accounted for by the characteristics of the virus concerned which differs considerably from those responsible for the epidemics of the last 25 years. Although it belongs to the A virus group it is the most aberrant type reported since the discovery of the influenza virus in 1933. Antigenic variants of the A virus are known to have appeared during previous epidemics but in recent years these variations have been fairly slight. Nevertheless wide differences in antigenic constitution have occasionally been observed as for instance in 1946-47 with the appearance of the strains classified as A/FM1/47 first isolated in Australia (strain A/CAM/46). The deviations observed in the "new" virus—designated for the time being A/Asia/57—are more pronounced than any so far observed even including these marked ones of 1946-47. Since most population groups have never been in contact with the virus and consequently have no acquired immunity to it the advance of the epidemic is meeting with little resistance.

### Epidemiology

The first notifications reporting the presence of numerous influenza cases were sent to WHO from Singapore on 4 May 1957. However as was afterwards discovered the epidemic had already been spreading for several weeks. It started in the north of China at the beginning of the spring and penetrated into the interior of the country where the virus was isolated for the first time at Peking in March. Cases next appeared at Hong Kong in the middle of April. The gaps existing in what should be a world wide

system of epidemiological notification have become painfully apparent on this occasion.

During May, June and July the epidemic spread very rapidly to the Philippines and Japan, South East Asia, and the Western Pacific then on to India, the Persian Gulf, Iran, Yemen, Aden, the Sudan, Egypt, Syria, Jordan and Australia. During the month of August foci appeared in North Central and South America, Europe and certain parts of Africa (see map facing p. 270). The epidemic spreads most of all in very dense communities where contact between individuals is easy and frequent. Thus in Japan and the Netherlands for example schools and camps have been particularly affected; the number of cases sometimes being as high as 60% of the total number of pupils. On board ship too series of cases have developed and have spread subsequently to ports and their hinterland. It would seem that these massive influxes of infected persons have played a big part in the spread of the infection than isolated cases transported by air.

In the northern hemisphere influenza is not generally a summer disease and this seems to be confirmed by the present epidemic since in recent months it has not spread in Europe or the USA to the extent which might have been feared. In tropical countries on the other hand there is no such marked seasonal periodicity but in fact very little is yet known concerning influenza epidemiology in these regions and there is no clear explanation why the infection has spread there and yet seems unable to spread in the northern summer.

In the southern hemisphere the influenza season begins as a rule in June, the highest incidence being reached during the following two or three (winter) months. This year the virus has been carried south of the equator during the most favourable season but the epidemic has not spread as rapidly as might have been expected and the proportion of

people affected appears to be lower than in some tropical areas

The disease appeared in Australia in May and was still spreading in June. Early in July it reached the Union of South Africa and Chile and during August it was spreading in Argentina, Southern Brazil and New Zealand.

### Clinical characteristics

This epidemic which has remained mild has caused very few deaths and these have been due for the most part to bacterial pulmonary complications. In a few areas the Philippines for example a fairly high death rate has been reported. It is difficult however in the absence of laboratory diagnoses for the majority of the cases to distinguish between deaths due specifically to influenza and those caused by other diseases resembling influenza in certain symptoms.

### The virus

The virus responsible for the epidemic is shown by the complement fixation test to belong to the A virus group. However it gives no cross reaction with the viruses of this group in the much more specific haem agglutination inhibition test. It is quite distinct from any of the viruses which have caused epidemics in the last 25 years and shows the most important deviation in antigenic composition observed among viruses since 1933. Recently Professor Mulder found in the Netherlands—and other workers in the United States of America and Australia have confirmed this—that some persons over 70 years of age possess antibodies against the new virus. It is not inconceivable that virus A/Asia/57 is related to the one which caused the 1889 pandemic. If this is confirmed it may prove to be a fundamental advance in our understanding of the epidemiology of influenza.

### Vaccination

Experiments in influenza vaccination have been carried out in certain communities for some twenty years past using the allantoic

fluid from the hen's egg infected with influenza virus and then inactivated with formalin. While duly recognizing the variability in the results observed in certain cases Dr T. Francis Jr still felt able to affirm that vaccination against influenza has been shown to be uniformly effective under a variety of conditions when vaccines of proper constitution and potency are employed.<sup>1</sup>

The decisive part played by the components of the vaccine and their antigenic power has been stressed by Dr von Magnus in the following words: "Studies of the antigenic variations among influenza viruses are of importance not only for a better understanding of the epidemiology of the disease but also for the problems associated with the procuring of an effective vaccine against it." It has been clearly established that a vaccine made from strains which differed considerably from the epidemic strain in question did not protect against the disease.

There can be no question of claiming to stop an epidemic by vaccinating against influenza. What is aimed at is the limitation of its effects by preventing high death rates and excessive absenteeism such as would disorganize the public services and bring society to a standstill. Certain groups should be given priority. First the medical services must be fit so that they may tend the sick while there is no specific treatment for influenza itself; most deaths are caused by the bacterial complications of influenza—principally pneumonia—and the antibiotic treatment available today makes it possible when it is given in time to keep mortality down to a minimum. Next the personnel essential for the proper running of the public services and basic industries must also be protected.

The first strains of virus A/Asia/57 as soon as isolation was achieved were sent by the World Influenza Centre and the International Influenza Center for the Ame-

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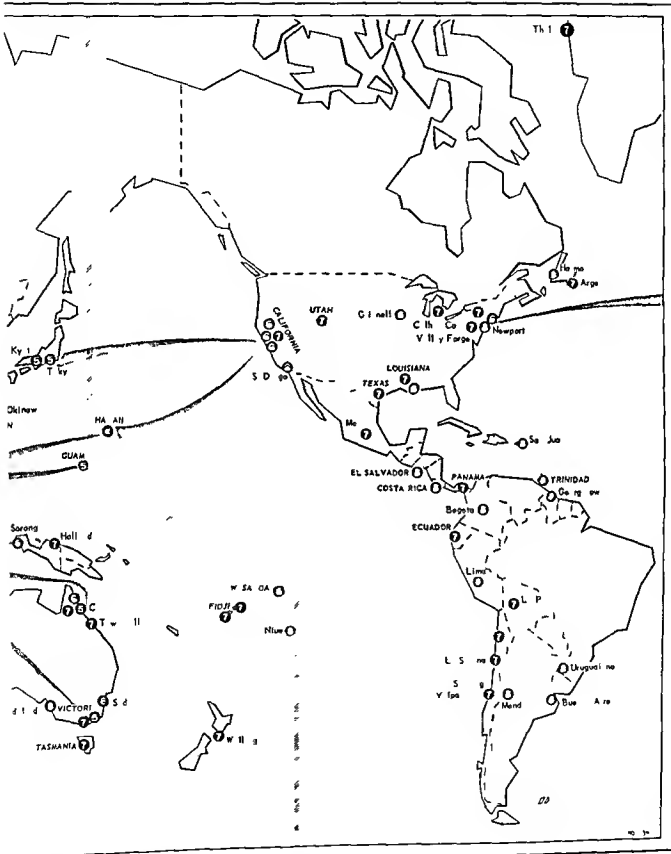









OM FEBRUARY TO 31 AUGUST 1957



hading shows the regions most affected



 *Probable origin of epidemic*

ricas to firms and laboratories preparing vaccines. Their task is to study the possibility of preparing a specific vaccine against this epidemic so as to be able to meet possible requirements in the near future. Information reaching WHO regarding the suitability of the "new" virus for use as a vaccine is so far not very encouraging. According to the initial analyses carried out in manufacturing laboratories, national centres and the World Influenza Centre, the virus has very little antigenic potency. Even a strain which appears to grow to a satisfactory concentration in eggs—as judged by the CCA (chicken cell agglutination) titre—stimulates the formation of very little antihaemagglutinating antibody in man. This may be due in part to the fact that most people have had no previous experience of this virus and that the vaccine is therefore acting as a primary stimulus. If this is so, it seems unlikely that a single dose would be sufficient to produce satisfactory immunization in man. Vaccination by inactivated vaccines such as those employed in recent years has the drawback of requiring a considerable amount of culture material (up to one egg per vaccine dose or even more in the case of strains with little antigenic potency). An attempt is therefore being made to develop an attenuated live vaccine. The doses required would then be smaller since the vaccine multiplies in the body. At an unofficial meeting of some eminent virologists held at the suggestion of WHO following the recent International Poliomyelitis Conference at Geneva, a new vaccination procedure described by Soviet workers was discussed. With this procedure the virus strain after an initial egg passage is cultured on human embryo tissue (where it undergoes a change in virulence) and then again cultured in the egg. The allantoic fluid either liquid or dried is sprayed into the nasal passages. In children this may give rise to a mild attack of influenza. The effectiveness of this method is still a matter of controversy.

The low antigenicity of the virus has also led to the failure so far of experiments in prophylaxis with hyperimmune serum. This is prepared by immunizing horses and the serum is then sprayed into the nasal passages as in the technique mentioned above. Injection of the Asian virus into the horse has brought about the formation of little or no antibody, certainly insufficient for effective protection.

#### Possible relationship between human influenza and swine influenza

Shortly after the influenza pandemic of 1918 a similar disease called "swine influenza" broke out among pigs in the Middle West of the United States of America. It now takes the form in a few States of winter epidemics of a mixed infection of virus and *Haemophilus suis*. In the inter-epidemic periods the virus is not found in the tissues of the pigs. However, earthworms taken from infected pig farms seem to carry inapparent viruses and these can develop in pigs eating the worms into normal viruses capable of being isolated from the respiratory system. The question therefore arises whether the pigs are in fact the virus reservoirs rather than being secondarily infected by the human virus as some have maintained. The occasion of the present epidemic is to be used to attempt to find out whether animals actually play a part in influenza epidemiology. Sera taken from pigs, horses and other animals in regions so far unaffected by the epidemic are to be submitted to serodiagnostic tests so that later on sera from the same animals can be studied and the antibodies compared using the same tests if the epidemic breaks out in these areas. In this connexion WHO has appealed to the veterinary and public health services of a number of countries in different parts of the world to undertake this research in collaboration with the WHO influenza centres.

[illegible]

in this department so that as many ambulatory patients as possible may be treated and at the same time receive the benefits of the advances made in medical science. The department has to be equipped too for the thorough study of more complex cases that will need to be admitted to the wards for further examination or treatment. In short a full comprehensive health care programme of the highest possible quality should be the aim of the out patient department. It should be equipped and staffed to provide specialized health care beyond the capacity of the general practitioner or health centre in the area. In some cases it may even reach out to the family in the home through domiciliary health care services.

In its turn in patient care of a high scientific standard should also be readily available. Naturally the extent to which the facilities for the achievement of this goal will be developed will depend on the size of the hospital and of the population to be served. The hospital's treatment should not stop at the acute phase of a disease; medical and social rehabilitation measures should also be instituted as early as possible.

Yet however perfect may be the care of the sick, this is not the full answer to the health care problems of the population. The full paraphernalia of preventive measures coming under public health is the essential complement. And the great majority of hospitals to day are tending more and more to integrate preventive work among their activities. Maternity hospitals have realized that certain immunizations can and should be given to the newborn child in the first few days of his life. With the discovery of the miniature X ray the possibility of tuberculosis and lung cancer case finding among all hospital admissions has become a reality. More and more too the opportunities for health education of patients and their families are being recognized and used by hospital nurses and medico social workers.

But in some places the trend towards integrating preventive medicine in the hospital has gone even further. Probably the children's hospitals have led the way by realizing

that the only way to prevent much of infant illness is to keep an eye on the child through well baby clinics either attached to or working in close relationship with the hospital. Then, too hospitals located in or near industrial areas have found that much of their day-to-day work is connected with industrial injuries or diseases. In many therefore preventive activities have been introduced in co operation with the industrial medical services. The hospital facilities for instance may be used for the pre-employment and periodic examination of workers and on the laboratory side for toxicological investigations. Sometimes a physical medicine department is also organized with the aim of preventing invalidism.

### Architecture and administration

Parallel to the growing complexity of medical care hospital architecture and administration have developed to the point of becoming specialties in their own right.

The hospital architect nowadays has to know not only the skills of his own profession but also the fundamentals of nursing and medical care. The hospital of the future brings to mind a modern mono block building ventilated and illuminated according to the various technical needs and complete with air-conditioning (at least for some services) central supply of oxygen and compressed air lifts and other easy transportation facilities and kitchen laundry and sanitary installations for a few thousand people.

The administration of a hospital of this kind includes the full range of problems involved in the administration of a small community with those related to the medical services for the sick added. Such matters as budget and running expenses record keeping and statistics supplies of all kinds personnel management and human relations and a variety of social problems are all daily concerns of the hospital administrator. Hence specialized training for the job is essential often to-day this training is of graduate standard.

# THE HOSPITAL OF THE FUTURE \*

It has been said that a hospital should not be built to last for a longer period than 20 years as by then the building and design will have become obsolete because of the new requirements created by the rapid advance of medical science. This concept has been shown to be especially true in recent years. It has been seen how sulfonamides and antibiotics have overthrown all the former complex ways of treating venereal diseases and the world is now witnessing the passing of the tuberculosis sanatorium era.

As some hospital facilities become outdated however new requirements come to the fore and there are ever increasing needs to be met. Many hospitals throughout the world have been faced during the last few years with the need to install say an electronic microscope and the advance of radiotherapy and radio active tracers has compelled others to build up entirely new premises so protected as to avoid risks for the personnel.

But it is not only the progress in diagnostic and therapeutic procedures that is causing the hospital to change. Social needs and the more modern social approach to health and disease have also an impact on its evolution. The hospital as the part of the medical and social organization of a country responsible for the health care of the population is called on to adjust its machinery to the new developments in the social field. To day out patient departments have become an indispensable part of the general hospital and physical medicine can no longer be ignored. The concept that the general hospital should be devoted to the care of acute diseases only is being revised and many hospital administrators have come to the conclusion that the chronically ill and the aged must also be catered for.

In other words the hospital's role is now seen as enlarged to take in preventive medi-

cine activities and this concept has received the endorsement of the Tenth World Health Assembly in its technical discussions held in May of this year<sup>1</sup>. Earlier in 1956 an expert committee brought together by WHO for the purpose of considering the hospital's place in programmes of community health protection adopted the same view<sup>2</sup>.

To foresee what the hospital of the future will be it is necessary first to analyse the trends in hospital care, the progress in administration and architecture and the impact of social needs and economic development on the hospital set up.

## The trend in hospital care

The hospital has long ceased to be a charitable institution for the care of the indigent. Gone are the days when the well to do private physician was wont to spend part of his time caring for the destitute with no other reward than the practice and experience gained. Nor is nursing any longer the exclusive field of the religious orders. Nowadays the hospital is a centre of technical knowledge and skills responsible for the health care of a given population. It has to be equipped to make a diagnosis immediately prescribe the right treatment and institute rehabilitation measures where required with the least possible delay. Modern practice demands too that the patient be kept ambulatory whenever possible so as to save costly hospitalization.

This has been the trend until recently and the hospital has organized its facilities to meet these requirements. A large out patient department is usually its front line. All the specialties and diagnostic and therapeutic facilities should be readily available.

\*Based on a address by Dr A. L. B. of the Section of Social and Occupational Health, WHO to the 10th International Hospital Congress held in Lisbon from 3 to 7 July 1957.

<sup>1</sup>Final report of the expert committee on the hospital of the future, WHO, 1957, 11, 198.  
<sup>2</sup>The expert committee report has been published in World Health Organization Technical Reports Series No. 12.

As regards staffing in the great majority of cases where international help is needed to set going a hospital programme there is usually a complete lack of trained persons on the spot. This is by no means a new situation. Florence Nightingale and other pioneers of hospital care also had to start from scratch.

In the first instance every effort should be made to gather a nucleus of staff from among national resources and talents. This will serve as the basis for further development later on when a proper training programme can be launched in conjunction with the construction programme. And international help is usually available to fill the initial gap and help in the training programme. An account of what can be done in this way appears further on.

By and large buildings and equipment represent the main problem for most countries.<sup>4</sup> The initial capital outlay for building a hospital is great and local governments often are faced with the alternative of giving the people a hospital for the sick or housing for the healthy. Building materials and manpower may also be scarce thus further limiting the country's building capacity. And again hospital equipment is costly and in many cases may have to be imported at the expense of a substantial proportion of the available foreign currency. In such circumstances it is hardly surprising that the priority given to hospital construction may be very low.

One national resource that should not be underestimated does however exist namely the power of the people themselves to contribute. Where a local community feels that a hospital is one of its basic needs its individual members are generally prepared to raise the necessary funds however poor they may be provided a well thought out technical plan is put before them. The obvious disadvantage to this direct participation is that the community wants to have a voice in such matters as choice of site kind of services to

be provided and so on without taking the broad view of the hospital's place within the scheme as a whole. It is in such circumstances that international assistance can be of great help by offering the independent technical advice of an outside expert who is not involved in local interests and politics.

Coming to planning itself this is a stage the importance of which cannot be over-emphasized. The problems of the choice of site and the size of building the number of beds and the specialties to be provided are only the fundamentals and the very beginning of the planning process. Yet the decisions on these points will govern the scope of future activities and a mistake in the early stages may well distort the whole pattern for the future.

What already exists in the way of hospitals obviously has to be taken into account. Where the shortage of beds is great the problem will have to be tackled on an emergency basis and hospital accommodation built up as fast and as cheaply as possible. In special cases transportable hospital units may have to be used even though this cannot be regarded as an adequate permanent solution.

To ensure objective appraisal of over all needs a national planning commission may be found of great help. This body should be a technical advisory one composed of physicians architects engineers nurses and administrators. Much of its work will necessarily be based on the findings of the pre planning hospital survey if indeed the organization of this is not its first task.

### International co-operation

The best approach for an international organization in giving help in this work is to provide a hospital planning team to work on the spot and give expert advice to the national authorities. In this way a hospital system ideally suited to the country may eventually be developed by regular stages. The basis of a team of this kind is usually a physician experienced in hospital planning and administration and an architect well

<sup>4</sup> For the information on this subject see R. J. Bridgman (1955) *The rural hospital structure and organization*. Geneva: World Health Organization Monograph Series No. 1.



## Economic burden on society

Obviously this highly specialized and elaborate machinery has become extremely costly and entails the employment of a number of professional people who are entitled to reasonable salaries in accordance with their skills. The unfortunate result of all this expansion is that hospital care has gone beyond the means of the ordinary family. And even social insurance institutions are to day finding difficulties in meeting the hospital bill while many governments are seriously concerned at its inflated total. Those responsible for planning the hospital of the future will have to try to find a reasonable compromise. In the meantime this important factor of financing has to be borne in mind in any programme of international aid for hospital development.

## The hospital in the social set up

The place of the hospital in a society has to be focussed from two angles. It should on the one hand be an expression of the needs and wishes of the community and on the other an instrument to serve the society itself. Accordingly a hospital should be planned with the active participation of the community bearing in mind the incidence of disease and injuries, the birth and mortality rates, the standard of living, the habits and religious beliefs, and the housing conditions and transport facilities of the area to be served.

The hospital need not necessarily be a beautiful modern building. A modest but comfortable emergency construction may equally well serve the purpose. But what is important is that the hospital should be adapted to the local conditions and should provide the best of comprehensive health care for the population.

A regional system is most likely to provide this adaptation of hospital facilities to local geography and population distribution. Special skills and equipment may be centralized in a regional hospital at the disposal of the region as a whole while a network of smaller intermediate and local hospitals can be

responsible for the simpler day-to-day care in their respective districts. In many areas the local hospital may act as a health centre so contributing to the desirable integration of preventive and curative medicine.

## Needs and resources at the national level

The importance of a thorough assessment of needs and resources in the early stages of planning a hospital programme cannot be over emphasized. It is astonishing how many times it has been found that the number of hospital beds available in a country was unknown or how often large capital investments have been made haphazardly.

The number of hospital beds required varies widely from one country to another depending largely on the incidence of disease and injury. Other factors to be taken into account include the availability of trained staff and of funds for it would obviously be unrealistic to launch an ambitious construction programme without these important elements to hand.

Many attempts have been made to establish a bed population ratio for universal application but the wide variation in needs and resources makes it necessary in practice to determine this locally for each particular case. Whilst many countries are aiming at a ratio of 7 or even 10 beds per thousand of the population others would be happy if they could achieve the modest goal of one per thousand.

Whatever the case may be however a fairly accurate survey of needs and resources is a pre requisite to the laying of future plans. In general countries are equipped to carry out this preliminary work for themselves but in certain cases it may have to be undertaken by foreign experts provided through international co operation programmes.<sup>2</sup>

<sup>2</sup> Hospital surveys have been carried out by WHO personnel in Ceylon (1951), Egypt (1951), Japan, WHO personnel have helped to lay the rest of the survey and by the United States Hospital Administration (1956). The United States typical representative hospital is the Brigham Young University Hospital (California) Hospital (1957). The United States Plan (1951) contains a typical sample of one of the most typical of these surveys which the foreign doctor is able to follow. The United States Plan (1951) contains a typical sample of one of the most typical of these surveys which the foreign doctor is able to follow. The United States Plan (1951) contains a typical sample of one of the most typical of these surveys which the foreign doctor is able to follow.

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# THE ERADICATION OF YAWS AND PINTA IN THE AMERICAS

The progress made in the control of yaws has recently been described in the Chronicle of the World Health Organization<sup>1</sup> In the May number of the *Bulletin of the Pan American Sanitary Bureau* data are published on the geographical distribution and the status of the operations against yaws and pinta (*mal del pinto*) in the Americas These data were communicated to the Seminar on Treponematoses Eradication (excluding syphilis) held at Port au Prince Haiti from 21 to 27 October 1956 and summarized in its final report

The geographical distribution of yaws and pinta in the Americas and the present status of these diseases in the region according to the above mentioned information may be summarized as follows

## MEXICO

Mexico Yaws does not exist pinta is prevalent in certain areas

## CENTRAL AMERICA AND PANAMA

British Honduras	}	Yaws apparently does not exist
El Salvador		
Honduras		
Costa Rica		
Guatemala		
Nicaragua	}	Sporadic cases of yaws only are reported
Panama		
		There are isolated yaws foci in three provinces

## CARIBBEAN REGION

Bahamas  
Barbados  
Montserrat  
Netherlands Antilles  
Puerto Rico  
U S Virgin Islands

No yaws cases have been reported in recent years

Grenada  
St Kitts  
St Vincent

Until recently yaws was hyperendemic in certain districts of these islands Mass treatment campaigns started in 1956 covered approximately 95% of the population The second stage of these campaigns has revealed a very low percentage of active cases

Antigua

Between 1953 and 1955 a few cases only were reported each year Mass yaws programmes are not being conducted

British Virgin Islands  
Cuba

A mass treatment campaign in 1956 revealed very few cases

Prevalence of yaws is limited to the Province of Oriente where a few foci apparently exist No control programme is being undertaken at the present time

Dominica

In 1955 1031 new yaws cases were reported representing an incidence of 17.5 per thousand inhabitants An eradication campaign is planned to start in 1957

Dominican Republic

A yaws eradication campaign was started in 1953

French Antilles

Annual incidence has declined steadily in the past ten years to the present very low figure of approximately 0.1 per thousand in Martinique and 0.2 per thousand in Guadeloupe

Haiti

The yaws eradication campaign is continuing

Jamaica

Systematic yaws control measures have been carried out in the past years but scattered foci continue to be found in a number of parishes

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St. Lucia	A recent survey revealed an incidence of 21 per thousand an eradication campaign is being planned		A campaign begun in 1950 has considerably reduced the prevalence which at present is estimated at 3.6 per thousand
Trinidad and Tobago	Scattered foci exist in certain areas but prevalence is low. An eradication campaign is planned to start in 1957	Ecuador	In the coastal province of Esmeraldas (population 100 000) 541 yaws cases were treated between December 1954 and April 1956. In the eastern region (population 50 000) prevalence is estimated at 80 per thousand. Nine house-to-house coverages have been carried out in the coastal area alone
	SOUTH AMERICA		8 cases per year are being reported. Yaws is limited to the tropical jungle areas. In 1955 555 cases were notified
Bolivia	Yaws is limited to some foci in the Department of La Paz.	French Guiana	No information available
Brazil	The yearly cost of service reports the presence of endemic and hyperendemic yaws in at least 235 municipalities with an estimated prevalence of 60 per thousand in a population of almost 9 million	Peru	A systematic yaws campaign has been in operation since 1946. The endemic area has an estimated population of 1 000 000 the annual incidence has declined steadily to a rather low figure at present.
British Guiana	An eradication campaign being undertaken in the County of Essequibo the only remaining endemic area	Surinam	
Colombia	The endemic area contains an estimated population of 500 000	Venezuela	

## Review of WHO Publications

*Bulletin of the World Health Organization*  
1957 Volume 16 Number 2 (pages 247-480)

This number includes articles on epidemiology of variola and murine typhus, cancer mortality in various countries, chemotherapy in lymphogranuloma venereum, the International Standard for Hyaluronidase and a ninth study on cholera, as well as notes on a number of other subjects.

F O MacCallum & J R McDonald give the results of an investigation made in England following outbreaks of smallpox in the cotton spinning industry due to virus imported in bales of raw cotton. They come to the conclusion that if cotton is stored for six months or more at a temperature of 30°C to 40°C before shipment the risk of introducing the virus into countries which are free from the infection is very slight. On

the other hand if the cotton becomes contaminated in regions with an average temperature of 20°C to 25°C or is kept in such regions while containing virulent scabs, infective particles may survive for several months.

An attempt at deratting by means of anti-coagulants and at disinsection by means of DDT made in Georgia in the United States and described by C O Mohr & W W Smith gives rise to the hope that it may be possible to eradicate murine typhus from the rural zones in which it is endemic. It is probable that similar methods could be used against plague.

A J Phillips & M Owchar analyse the statistics of mortality from malignant neoplasms and show that in the eight countries studied the position varies considerably. For example in Japan there is a particularly high mortality rate from tumours of the digestive

system but a very low rate from tumours of the genital and urinary systems. The mortality rate from breast tumours is also very low among the Japanese as is that from tumours of the uterus in Israel.

Chemotherapy in lymphogranuloma venereum has long been a controversial subject. A. B. Greaves, M. R. Hilleman, S. R. Taggart, A. B. Bankhead & M. Feld give an account of a comparative study carried out with the aid of a control group and indicating that equally good results are obtained by the use either of the antibiotics or of sulfonamides.

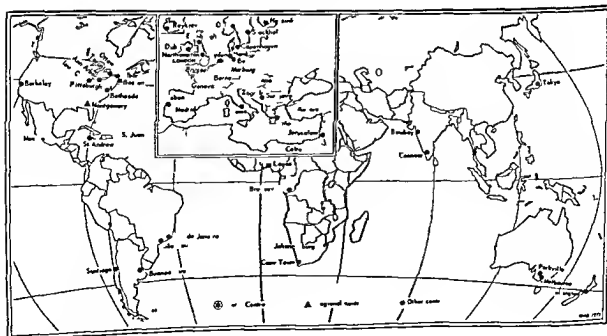
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## WHO INFLUENZA CENTRES



# LABORATORY ASPECTS of INFLUENZA CONTROL

In the space of a few months the influenza virus can spread all over the world and even though causing but a mild infection it can disorganize for weeks at a time the social and economic life of the countries through which it passes. The highly infectious nature of the disease and the speed with which it spreads have caused it to be said that When influenza is epidemic one tends to think—not whether one will get it but when will one get it?

A number of factors—the universal nature of the disease the pandemic form it has assumed on several occasions during the last seventy years its vagaries due in part to the variability of the virus the ephemeral immunity it leaves behind it—have called for concerted action since every country of the world is threatened. In 1948 the World Influenza Centre was established in London under the auspices of WHO in the years that have followed a network of national centres spread all over the world has been developed (see map p 280). In addition the epidemiological services of WHO collect and transmit information on the appearance and spread of epidemics their seriousness the number of cases occurring etc. This work will be fully effective only when every country collaborates in it. The national centres the International Influenza Centre for the Americas and the World Centre receive pathological matter—or the first egg passages of virus—from the various areas where an epidemic is raging. The virus is then isolated identified by serological methods compared with viruses isolated in





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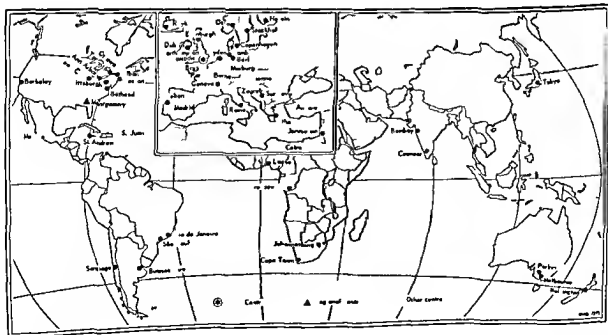
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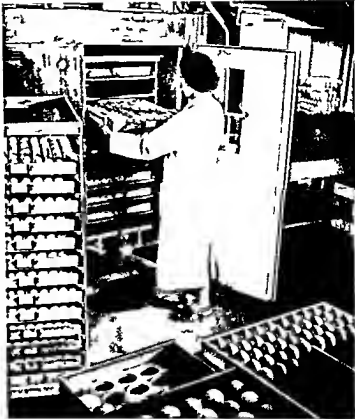
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## WHO INFLUENZA CENTRES



ination raises many problems. The influenza virus as it appears when fixed on red cell (1) takes the form of a particle—with a diameter of about  $1/10000$  mm—or of filament the new virus A/Asia 57) is frequently found in the latter form. Like other viruses the influenza virus will not multiply on artificial culture media. The most convenient culture method is inoculation into the fertilized hen's egg on the thirteenth day of incubation. To isolate the virus for study intra-embryonic inoculation is employed (2a) in order to culture it for vaccine preparation it is inoculated by the allantoic route (2b). In principle the intra-allantoic method consists in introducing the needle of a syringe containing the virus suspension through the shell (3) at a point 1 cm from the air sac to a depth of 12-14 mm. After four days incubation the shell is opened at the air sac

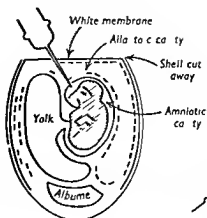


- 6 The shell membrane is carefully removed and the chorio-allantoic membrane drawn aside without injuring the blood vessels (4). The allantoic fluid which will serve as vaccine is removed by aspiration. The virus is then inactivated with formalin. In the case of semi-industrial preparation the infected eggs are placed in the incubator in superposed trays (5); opening of the eggs is done by dental drill (6). Extraction of the allantoic fluid is done in an aseptic compartment into which the operator inserts his hands only (7).

If it is to be effective the vaccine must contain a suitable amount of virus antigen. In the case of the inactivated vaccine the quantities necessary are relatively high as much as the whole culture from one egg is required for a single

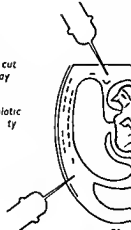
previous years and its virulence and antigenicity are assessed. As soon as isolation is achieved the viruses are sent to specialized firms and laboratories so that the possibility of preparing an effective vaccine from the virus actually causing the epidemic can be examined since it has been found that one variant of the virus does not necessarily confer immunity against another. The influenza virus has not the stability of for example the small pox virus. It is more malleable more protean than most pathogens so that

Amniotic inoculation



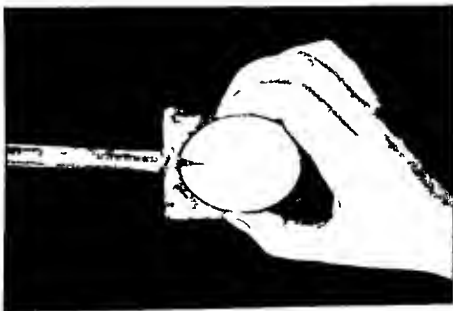
2a

Allantoic inoculation



2b

3



4



consideration are reminded that the legislation adopted should be appropriate to the existing legal structure, the stages of development of the milk industry and milk practices, the economic status and other problems and public health needs of the country.

Legislation should be limited to essential health requirements and should be so drafted as to provide for some degree of flexibility in compliance. Care should be taken not to adopt extreme measures tending to reduce the supply of milk for proper nutrition purposes and to avoid premature displacement of traditional practices.

Education must precede the enactment of legislation since the latter itself cannot raise the level of milk production; this can be achieved only through the application of hygiene measures to the dairy industry. Hence milk producers and personnel must understand the existing specific requirements and the practical methods of compliance and must be helped to solve their problems through advisory services. Experience in many countries has shown that an educational approach yields better results than police methods.

Within the dairy industry, specific measures designed to improve hygiene and these may well be incorporated in industry activities as a valuable adjunct to

official milk hygiene programmes. The official agency should co-operate with the industry in the development and conduct of activities of this kind. The measures referred to involve first the establishment of field inspection and laboratory services for periodic inspection of producer farms and examination of milk samples taken at the point of collection with a view to assisting the individual producer to improve the quality of his product; secondly, the fostering of monetary incentive systems for the production of high quality milk; and thirdly—since many milk producers need additional equipment and facilities in order to improve the milk quality—the provision of financial help so that needed improvements may be financed over a long period.

Other sections of the report deal with such matters as the health and cleanliness of milking staff, milking methods and their influence on udder health, the cleansing and bactericidal treatment of milking utensils and equipment and dairy plant, milk handling on the farm, milk collection and transportation with special reference to protection against contamination and measures to maintain the keeping quality of the milk, testing for quality control and safety of the product, health control of dairy plant workers, milk hygiene in the home.

The report ends with a series of recommendations to FAO and WHO on future co-ordinated research in milk hygiene. The principles of official supervision of milk and milk products are discussed in an annex.

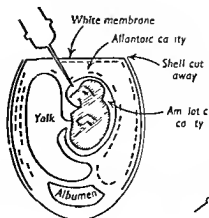
## INSECTICIDE RESISTANCE

Infected by arthropods and insect-borne diseases is an important problem for health administration. The initial results of insecticides gave rise to the hope that these diseases could be controlled and even combated more or less effectively, but resistance to

chlorinated hydrocarbon insecticides which has appeared in various vector species has somewhat changed this outlook. Resistance which has developed much more rapidly than the measures available to combat it at present represents the main obstacle in the fight against arthropod-borne diseases. Thus the Expert Committee on Insecticides devoted its 7th session more particularly to a study of the present problem of resistance and to

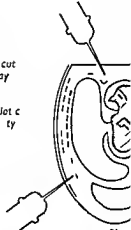
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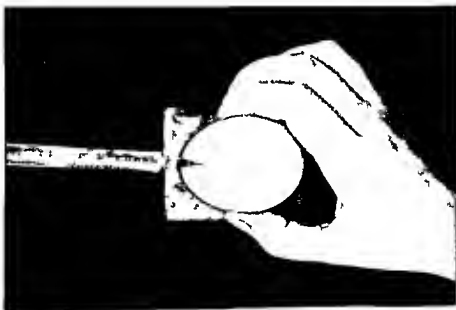
2a

Allantoic Inoculation



2b

3



4



# Reports of Expert Groups

## MILK HYGIENE

Milk and milk products if not produced under hygienic conditions may lead to disease in the human consumers. Milk hygiene measures therefore embrace the health of milk producing animals, sanitary practices in the production, handling and processing of milk and milk products, treatment for the destruction of pathogens in the milk and protection against subsequent contamination of the product. In the first report of the Joint FAO/WHO Expert Committee on Milk Hygiene<sup>1</sup> attention is concentrated on hygiene problems relating to cow and buffalo milk and to a lesser extent to goat milk.

One of the major problems in milk hygiene stems from the broad range of local conditions throughout the world. The same general principles are basic to dairy hygiene the world over but how these are applied must necessarily vary widely from one country to another. Countries still in the early stages of developing a milk programme find it difficult—if not impossible—to apply the hygiene practices utilized in the more advanced countries. The report accordingly places emphasis on simple yet effective measures which will provide the maximum benefit to public health for the effort expended.

At the outset it is stressed that there can be no assurance as to the safety of fluid milk and of many milk products without effective heat treatment of the raw product and subsequent protection against contamination.

One of the important factors in clean milk production is protection from external contamination at the time and place of milking. On the farm every effort should be made to avoid the introduction into the milk of micro-organisms or dirt in any form and to inculcate the idea that subsequent straining

filtering, refrigeration or heat treatment can not be substituted for clean milk production. It is noted that high bacterial content in the raw milk may cause gastro-intestinal disturbances even where the milk is subsequently treated to kill off the bacteria.

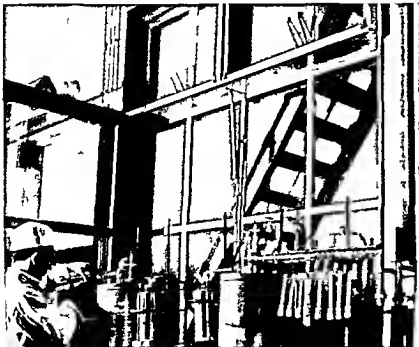
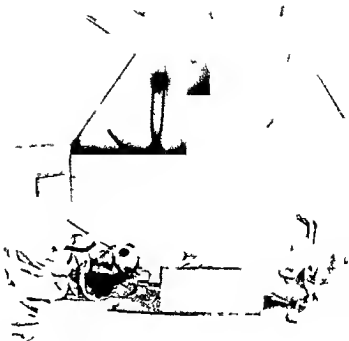
### Diseases transmissible through milk

The diseases transmitted through milk may be divided into two broad categories: diseases of man for which animals may serve as a primary source of infection and diseases primary to man but which are transmissible through milk. The milk obtained under sanitary conditions from dairy animals in perfect health while excellent for direct human consumption is all too rare a commodity because few herds of cows in any country of the world are always healthy and conditions of milking, from the hygienic standpoint frequently leave much to be desired. The general principle of subjecting all milk destined for human consumption to adequate heat treatment is therefore strongly recommended. In the past milk has served as the vehicle both for epidemics and sporadic outbreaks of disease in man but these have become relatively rare in countries where adequate heat treatment is a basic principle in a well established milk control programme.

The report goes on to discuss the major communicable diseases of man in the two broad categories mentioned above. Attention is drawn to the vexing problem caused by the use of antibiotics in the treatment and control of mastitis in milk producing animals. Authorities differ on the harmful possibilities that may arise from the human consumption of milk containing low levels of antibiotics derived from this source. The dilution factor usually reduces the antibiotic content to very low levels and as yet

dose of vaccine when the antigenicity of the strain is low. The vaccine can be concentrated by various methods. Beyond a certain point, however, the serological response does not increase in proportion to the vaccine concentration. Furthermore, very high concentrations are not advisable, since they may give rise to local reactions (erythema, oedema) or fever, or indeed to reactions of the anaphylactic type in subjects sensitized to egg protein.

Efforts to develop a vaccine for the purpose of warding off an epidemic like the one that is spreading so steadily all over the world this summer must be collective. A single country cannot hope to protect itself against an impending epidemic without knowing the nature of the virus to be combated. What the network of WHO influenza centres offers every country is the fruit



8 of carefully co-ordinated national collaboration, i.e. identification of the virus, notification of epidemics in their stages, early warnings to health authorities of impending danger, dispatch of freeze-dried virus samples (8) and specialist advice and assistance in the training of technicians. These are means which are now being employed in an attempt to limit effects of pandemic influenza.

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Regulations should be limited to essential public health requirements and should be so drafted as to provide for some degree of flexibility in compliance Care should be taken not to adopt extreme measures tending seriously to reduce the supply of milk needed for proper nutrition purposes and to result in premature displacement of traditional practices

Then too education must precede the enforcement of legislation since the latter will not by itself raise the level of milk hygiene This can be achieved only through day to-day application of hygiene measures by the dairy industry Hence milk producers and dairy personnel must understand the reasons underlying specific requirements must be taught practical methods of compliance with these and must be helped to solve their difficulties through advisory services Experience in many countries has shown conclusively that an educational approach of this kind yields better results than police type enforcement methods

In some countries the dairy industry itself has adopted measures designed to control milk quality and these may well have wider application Industry activities of this nature can be a valuable adjunct to

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Other sections of the report deal with such matters as the health and cleanliness of milking staff milking methods and their influence on udder health the cleansing and bactericidal treatment of milking utensils and equipment and dairy plant milk handling on the farm milk collection and transportation with special reference to protection against contamination and measures to maintain the keeping quality of the milk testing for quality control and safety of the product health control of dairy plant workers milk hygiene in the home

The report ends with a series of recommendations to FAO and WHO on future co-ordinated research in milk hygiene The principles of official supervision of milk and milk products are discussed in an annex

## INSECTICIDE RESISTANCE

The diseases transmitted by arthropods and in particular the insect borne diseases constitute one of the most important problems with which national health administrations are confronted The initial results obtained with modern insecticides gave rise to the hope that most of these diseases could be successfully controlled and even completely eradicated within a more or less short period However the resistance to

chlorinated hydrocarbon insecticides which has appeared in various vector species has somewhat changed this outlook Resistance which has developed much more rapidly than the measures available to combat it at present represents the main obstacle in the fight against arthropod borne diseases Thus the Expert Committee on Insecticides devoted its 7th session more particularly to a study of the present problem of resistance and to



specific and substantiated reports of subsequent difficulties arising in human beings are very rare. Nevertheless it is recognized that in exceptional instances disturbance may be caused in persons highly sensitive to antibiotics. It is therefore advocated that the milk from cattle treated with antibiotics by intramammary infusion should be excluded from the general supply for at least the first two milkings following therapy and where possible for a period of 48-72 hours thereafter. Where economic hardship would result from this second measure the milk may be kept separate and used for purposes other than human consumption but it should on no account find its way into the manufacture of fermented milk products. The presence of antibiotics in such products can cause much difficulty. A number of measures for lessening the incidence of mastitis are set out in the report.

### Supply and sale of milk

On the question of quality it is noted that in general it costs the producer more in time, thought and money to deliver at all seasons of the year a milk of consistently high quality. It is therefore deemed just that the producer of high quality milk should receive a higher price per unit delivered and that milk of demonstrably poor quality should command a lower price than the ruling average. Furthermore both in less well developed and in advanced countries payment on quality has proved to be a potent impulsion towards the production of better milk. The report describes in detail the working of one system of payment on quality that is now in use and notes that this measure may be combined with payments on the basis of herd status (tuberculin tested) and of compositional quality as determined for instance by fat or total solids content.

With regard to different processes in preparing milk for human consumption the report states that the value of pasteurization for the protection of human health is now amply established. No authenticated case of communicable disease has as yet been

traced to milk properly pasteurized in the first instance and subsequently protected from recontamination. Sterilized milk has the advantage of prolonged keeping quality. Processing methods have been developed for producing a truly sterile milk by heating to temperatures of up to 150°C for a relatively short period of time. In hot climates especially this form of milk has great utility.

Attention is drawn to the problem arising from the unhygienic practices of direct sale of milk from the farmer to the consumer and of milk retailing by itinerant pedlars. It is difficult in these operations to eliminate the sale of highly contaminated milk; moreover adulteration is very often a concomitant. These practices should if considered be discouraged and eventually prohibited. In recognition of the difficulty of enforcing such prohibition in areas where demand exceeds supply the report confines itself to recommending that wherever control measures are easier to institute—as in large municipalities—direct sales of this kind be prohibited as soon as recognized suppliers are able to meet the needs. The argument that such sales mean a lower priced product for the consumer is fallacious. A fraudulent retailer can always keep his price down by practising adulteration—and this often with dirty water—in the knowledge that he can do so with impunity over long periods of time because of the difficulty of official supervision of such activities.

The practice of boiling milk irrespective of whether it is in the raw or pasteurized state is common in some countries. Where milk programmes develop satisfactorily however this unnecessary habit in the case of pasteurized milk tends to disappear. Nevertheless wherever there is any doubt of the hygienic quality of any type of milk the report advocates that it be boiled prior to consumption. After boiling milk should be cooled and thereafter kept covered and cool if not consumed immediately.

### Milk hygiene legislation

Countries where the promulgation of milk hygiene legislation or regulations is

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Countries where the promulgation of milk hygiene legislation or regulations is

epidemiological services should be developed in symbiosis with public health laboratory services or even form part of them to ensure as close collaboration as possible but it may be found that there is so urgent a need for controlling a particular disease that a special campaign must first be undertaken. If circumstances permit the laboratories serving this campaign may then be incorporated in the public health laboratory service.

In whatever way a public health laboratory is set up its primary function will be to act as a service institution. "It is only one element or thread in the fabric of public health services and disease control and it operates most effectively as the scientific and technical member of an integrated team that carries on a planned campaign against disease. Nevertheless the Committee points out some research should be encouraged as a secondary function. Many scientific problems of practical importance to the country will be encountered and will provide unequalled opportunities for special studies by an able and intellectually curious laboratory staff."

But together with this the Committee sounds a note of warning to those who would attempt too much. In attempting to bring its public health laboratory services to a high degree of development by modern standards the less developed country should not hope at one step to bridge the gap of many years represented by the advanced programmes in certain other countries. Although it will be possible in many instances to profit from their experience to borrow concepts and techniques and to shorten the developmental period to a significant extent this borrowing should be done selectively with care and discrimination. Sound planning should not expect to avoid altogether the pains and frustrations of slow evolution. The seedling of modern development cannot be successfully transplanted until the local soil is ready to receive it.

No attempt has been made in this report to give any definitive account of the structure and functions of a public health laboratory

service since these must inevitably vary according to the needs and circumstances of each country but a variety of elements has been considered including medical microbiology and serology sanitary bacteriology epidemiological investigations preparation and distribution of diagnostic reagents and of prophylactic materials and research. In the better developed countries the main organizational features of a public health laboratory service are generally the central laboratory which acts as the parent institution and as the administrative headquarters reference laboratories each specializing in a particular branch of laboratory work district laboratories doing general work in a circumscribed area mobile laboratories carrying out examinations of specimens which for reasons of distance or difficulty of terrain cannot well be sent to the district laboratory and clinical side rooms in which simple diagnostic tests may be made. While each of these elements should have its requisite degree of autonomy the service should be organized "as a corporate elastic body with the individual laboratories working together as part of an organic whole."

The Committee also devoted much attention to the question of staffing and laid great stress on the paramount importance of providing a well qualified technical staff in the earlier stages of development of a public health laboratory service. The heads of both central and district laboratories should be medically qualified non medical science graduates are most fitted for work in reference and research laboratories where they are not called upon to act in a medical consultative capacity. Technical assistants should have at least a higher general primary education and should be given special supplementary training for which various schemes are outlined in the report.

At the end of the report a brief description is given of the organization of public health laboratory services in Ceylon, England and Wales, the Federal Republic of Germany, France, Sweden, the Union of South Africa, the United States of America, and Yugoslavia.

pointing out the measures of an international nature called for

Summarizing the present status of the question the Committee's report<sup>1</sup> stresses that resistance is now universal in the house fly that it is frequently found in the louse and that it has been reported in the case of various species of mosquito (*Anopheles Aedes oegypti Culex*) as well as in at least 27 other insect species. An inquiry carried out by WHO with the aim of determining what research is under way on the resistance problem has shown the inadequacy of the work being undertaken in this field. The report indicates the broad outline of an international co-ordinated research programme on resistance which should include in particular the collection and diffusion of information the promotion of research the increase of personnel and financial means devoted to this work the adoption of standard test methods the testing of new insecticides the establishment of satisfactory liaison between research workers and laboratories and the convening of meetings and conferences.

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The report adopts with certain amendments the definition of resistance formulated during the Symposium on the Control of Insect Vectors of Disease held in Rome in 1953 and puts forward recommendations on the means to be used to detect and measure resistance. It discusses in particular the various applications of a standard test method which would make it possible to obtain data on the appearance of resistant insect strains. It also mentions a certain number of problems connected with the biological aspects of resistance which should be studied without delay.

A second part of the report devoted to the disinsectization of aircraft contains revised specifications for aerosols and aerosol dispensers accompanied by a description of suitable test methods as well as new recommendations concerning the method of carrying out disinsectization for quarantine purposes.

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## PUBLIC HEALTH LABORATORY METHODS

The Expert Committee on Health Laboratory Methods met in Geneva from 22 to 27 October 1956 and its first report has just been published<sup>1</sup>.

The Committee discussed in particular the role and organization of a public health laboratory service and paid special attention to laboratory problems as they affect under developed countries many of which are just starting laboratory work and are in need of expert advice.

It is now recognized that the potential value of public health laboratories in preventing and controlling infectious disease is

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so great as to render them indispensable and that this value is most enhanced when the bacteriological work in the laboratory is closely linked to epidemiological work in the field. In the words of the report "Epidemiology provided the original stimulus for the creation of public health laboratories and it is epidemiology which in its turn is providing the laboratories with one of the chief means by which to assess the prevalence of disease and to bring it under control. However before a public health laboratory service may be started in a less developed country it is well first to obtain a clear picture of the nature and extent of the infections and the communicable diseases which will have to be combated. Ideally

data and to advise on its application to public health

One of the most difficult problems is that of producing a safe vaccine that will remain consistently potent. Wide variations of potency are known to occur in the course of manufacture. It is clearly important to be able to reduce these variations and as a means to that end to develop satisfactory methods for the measuring of potency.

The Expert Committee was also asked to make recommendations on the appropriate moment for introducing vaccination programmes having regard to the extent of the disease in any given country.

Since the first meeting of the Expert Committee on Poliomyelitis was called in 1953 WHO has developed a programme designed principally to assist Member States without adequate laboratory facilities to obtain the information needed before an immunization campaign can be properly planned. This need was met by designating in each region a specialized laboratory equipped and willing to carry out the necessary investigations. The directors of these laboratories were all invited to attend this latest meeting where the work done was to be reviewed and recommendations made for improvement and further development of the WHO programme.

The Committee was also to review the progress made in developing an attenuated live virus vaccine which might be capable of providing life long immunity against polio. A vaccine of this kind would have the great advantage that it could be administered by mouth instead of by injection. At the present time live virus vaccines are being used against smallpox and yellow fever.

The inclusion on its agenda of the question of diseases resembling poliomyelitis in that they produce symptoms of paralysis and encephalitis but which are not caused by the polio virus was a new departure for the Expert Committee.

The Committee's report will come before the Executive Board of WHO at its January 1958 session if its publication is approved it will be printed shortly thereafter in the *WHO Technical Reports Series*.

## Air pollution

Public health authorities are becoming more and more conscious that the pollution of the atmosphere has an important bearing on the health and well being of populations. It has long been recognized that smoke is a nuisance and has serious destructive effects on buildings due to the release of corrosive sulfur compounds in the combustion of coal. With the growth of industry new health hazards have come into being—the release of arsenic in copper smelting, the discharge of nitrous oxides and the contamination of the air with lead, zinc and other poisonous fumes—all of which have given rise to grave concern for the health of the communities exposed. This trend towards treating air pollution as a public health problem was spurred on by the fatal episodes in the Meuse valley, Donora (USA) and London which brought to public attention in startling fashion the lethal effects of such toxic gases and fumes.

Air pollution can no longer be considered merely a nuisance, nor can it be dealt with solely as a smoke abatement problem. Studies in England, the United States of America and parts of the Soviet Union reveal that apart from the climatic effects of massive exposure, long term insidious effects on human health may be caused by the continual presence of such contaminants as petroleum hydrocarbons and other gases commonly found in the air of cities. The possibility of damage arising from the pollution of the atmosphere with radioactive materials is also engaging the serious attention of health authorities.

Believing that the time has now come for international action on this problem, WHO is convening an Expert Committee on Air Pollution to meet in November of this year. The Committee will take up its work under four main headings: recognition and evaluation of air pollution including meteorological and physiographical factors; the nature of air contaminants; sources of pollution; sampling and analysis; effects of air pollution on *inter alia* human health, plants, animals and economic and sociological conditions.

## Notes and News

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### Place of meeting of Eleventh World Health Assembly

The Director General of the World Health Organization announces that he has reached agreement with the Government of the United States of America on Minneapolis (Minnesota) as the place of meeting of the Eleventh World Health Assembly and of the Special Tenth Anniversary Session that will precede it. These two meetings are to be held in May 1958.

In May of this year the Tenth World Health Assembly accepted the invitation of the United States Government to hold the two 1958 sessions in the United States and the decision on the exact time and place was left to be agreed between the Director General and the Government of the United States.

The United States Government and the City of Minneapolis have generously offered to meet the extra costs involved in holding the Assembly away from the WHO Headquarters at Geneva.

The Special Anniversary Session which is to last for two days is being held to celebrate the founding of the Organization in 1948. It was on 7 April of that year that the WHO Constitution was ratified by the twenty sixth State Member of the United Nations and thus entered into force.

A special report reviewing all the activities of the Organization during the first ten years of its existence is to be submitted to the Eleventh Health Assembly.

### WHO meeting on poliomyelitis

The WHO Expert Committee on Poliomyelitis met in Geneva from 15 to 20 July 1957. Sir MacFarlane Burnet (Australia) was elected as Chairman and Dr V D Soloviev (USSR) and Dr J H S Gear

(Union of South Africa) as Vice Chairman and Rapporteur respectively. The remaining members were Dr H Bernkopf (Israel), Dr H K Cowan (United Kingdom), Dr S Gard (Sweden), Professor J H Hale (Singapore), Dr M Kitaoka (Japan), Dr P R Lepine (France), Dr F P Nagler (Canada), Dr J R Paul (United States of America), Professor F Przemycki (Poland) and Dr A B Sabin (United States of America). Dr J L Melnick (United States of America) attended as a consultant.

The main task of this group of experts was to review the experience gained in those countries where inactivated poliovirus vaccine (similar to the Salk vaccine) has been used on a large scale to examine the problems of large scale production and safety and potency testing of the vaccine and to discuss the organization of vaccination programmes. The Committee was also to examine the prospects of using a live virus vaccine.

The development of a vaccine effective against poliomyelitis has excited enormous interest in many countries throughout the world. But many difficulties and problems have arisen in regard to production, testing and administration.

A number of countries have asked for the guidance of the World Health Organization in developing programmes of polio control. Towards the end of 1955 WHO brought together in Stockholm a group of experts to review the situation as it then stood following the confusion caused by the unfortunate incidents of the early large scale vaccination campaigns.

The recommendations of the Stockholm group formed the basis on which many health authorities have developed their vaccination programmes. Since that time much more knowledge and experience have been accumulated and the present Expert Committee was convened to consider the new

It is expected that the Centre will prove of value for control of pharmaceutical preparations and for purposes of pure research. It will operate for some time on an experimental basis and probably there will be no notable increase in the number of substances held until adequate information on its usefulness is available.

Laboratories and institutes working on a non-profit basis will not be charged either for the substances or for the costs of shipping. Commercial firms will be charged US \$4.00 or the equivalent amount in other currencies to help towards covering some of the costs incurred by the Centre. A charge will always be made for despatch by airmail.

The eight authentic chemical substances now available at the Centre are listed below together with the unit and size. Most packages contain sufficient material for about 20 assays.

	Size	
Chloramphenicol	1	300 mg
Digoxin	5 capsules of	10 mg
Ergometrine maleate	2 capsules of	10 mg
Melarsen		1 g
Oestrone		30 mg
Progesterone		65 mg
Tubocurarine		30 mg
Vitamin A Acetate	5 capsules of approximately	
(this is an oily solution of Vitamin A Acetate)	86 milligrams (0.344 micrograms of Vitamin A Acetate is equivalent to 1 International Unit— <i>Wld Hlth Org Jch R p S</i> 1940 34)	

Orders should be sent and cheques made payable to Centre for Authentic Chemical Substances, Apotekens Kontrollaboratorium, Lindhagensatan 128, Stockholm, Sweden.

### Yaws Eradication in Brazil

In October 1956 the Brazilian Ministry of Health started a campaign for the eradication of yaws after five months of planning and preliminary work. The campaign is under the direction of Dr F. Nery Guimarães of the Ministry's National Department for Rural Endemics. Dr Guimarães was the first investigator in the Americas to apply penicillin in yaws; he is a member of the WHO

### Expert Panel on Venereal Infections and the Treponematoses

Up to 30 April 1957—after seven months of field work—1 080 237 rural households had been surveyed and 4 422 156 persons had been examined in house-to-house investigations. A total of 374 792 persons suffering from yaws and 300 545 contacts had been treated with long acting penicillin.

A seminar on yaws eradication was organized by the Pan American Sanitary Bureau (acting as the WHO Regional Office for the Americas) and the Government of Haiti in Port au Prince in October 1956. Forty-eight public health administrators and treponematoses specialists in the Americas including Brazil participated. The progress made in the Brazilian yaws campaign since that time has been considerable. International assistance to the campaign from WHO and UNICEF has been granted at the request of the Brazilian Government. At its session in April 1957 the UNICEF Executive Board voted \$199 500 for provision of transport equipment and supplies for this project.

### Forthcoming Study Group on Ataractic and Hallucinogenic Drugs in Psychiatry

It is becoming necessary to obtain a balanced and critical international appraisal of experience in the rapidly expanding use in psychiatry of certain drugs currently known as "tranquillizers", "narcobiotics", "psychosomatics" or "ataractics". The antagonism of these drugs to substances such as mescaline and LSD 25 that produce "model psychoses" raises important questions in clinical psychiatry particularly from the point of view of the understanding of the physiological mechanisms involved in psychiatric disorders.

To study these problems WHO is convening a group of experts who will meet from 4 to 9 November 1957 in Geneva. Since a number of large scale seminars and conferences have already been devoted to exchange of information on the use of these



air pollution administration including legislation standards and enforcements the prevention and control of air pollution

### Automation and mental health

The trend towards automation that is rapidly gathering speed in more industrialized countries of the world has caused a chain reaction among the workers. Some regard the new automatic techniques in the light of a saviour whereas others have become obsessed with irrational fears about the prospect of possible displacement. But whatever the sentiments aroused the situation has created urgent problems in mental health and WHO is taking action to study these.

For this purpose it is calling together in 1958 a group of mental health specialists drawn from countries of diverse cultures. The Study Group's task will be to examine the evidence on the effects of automation on mental health and suggest measures likely to be helpful in combating its harmful influences.

Within industry itself automation has an immediate and far reaching impact on employment wages working conditions supervision the conditions of mass work and the whole nexus of human relationships within plant or office.

But while beginning in industry—like earlier technological revolutions—automation nevertheless profoundly affects the industrial communities as well since the three shift system characteristic of the automated factory necessarily entails a reshuffling of community and family arrangements. Other institutions likewise feel its touch. Right from the start the trade union movement in all countries has watched developments closely and has been quick to point to both the dangers and opportunities for labour that are implicit in automation. More recently educators have begun to examine and discuss its meaning for them. Calling as it does for a host of new technical and intellectual skills automation is making unexpected demands on the educational systems of most of the

countries where it has taken root. Lastly the governments of all these countries as well as of those where automation is anticipated are showing themselves alert to its possible repercussions on government itself as a result of these direct impacts on various aspects of the population's life.

It is impossible to estimate how fast automation will progress and how far reaching its ultimate impact will be. One certainty however is that this new technological development has a bearing on mental health and it is with this aspect that the WHO study group will be concerned.

### Centre for Authentic Chemical Substances

A Centre for Authentic Chemical Substances has been established at the Apotekens Kontrollaboratorium in Stockholm in accordance with an agreement between the Apotekarsocieteten Stockholm and the World Health Organization. These arrangements are the outcome of recommendations of the Expert Committee on Biological Standardization in its sixth report<sup>1</sup> to the Expert Committee on the International Pharmacopoeia and of the latter Committee in its twelfth report. The Centre is to collect assay store and distribute a restricted number of pure chemicals for use for reference purposes by control laboratories.

The collection is to include mainly substances for which international biological standards have been provided in the past and which can now be characterized entirely by physico-chemical methods and other chemicals required as reference standards in the fields of medicine and pharmacy on the advice of the Expert Committee on the International Pharmacopoeia.

Eight authentic chemical substances are now available some of which were handed over by the Medical Research Council London the others were acquired either through the co-operation of the United States Pharmacopoeia Reference Standards Office or purchased from commercial firms.

It is expected that the Centre will prove of value for control of pharmaceutical preparations and for purposes of pure research. It will operate for some time on an experimental basis and probably there will be no notable increase in the number of substances held until adequate information on its usefulness is available.

Laboratories and institutes working on a non-profit basis will not be charged either for the substances or for the costs of shipping. Commercial firms will be charged US \$4.00 or the equivalent amount in other currencies to help towards covering some of the costs incurred by the Centre. A charge will always be made for despatch by airmail.

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Melarsen	1 g	
Oestrone	30 mg	
Progesterone	65 mg	
Tubocurarin	30 mg	
Vitamin A Acetate	5 capsules of approximately 8.6 milligrams (0.344 m. ro grams of Vitamin A Acetate)	
(this is an only solution of Vitamin A Acetate)	1 equivalent to 1 International Unit (— <i>Wld. Hlth. Org. J. Jan. R. p. Ser.</i> 1950 3 4)	

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To study these problems WHO is convening a group of experts who will meet from 4 to 9 November 1957 in Geneva. Since a number of large scale seminars and conferences have already been devoted to exchange of information on the use of these

drugs the WHO study group's task will be limited to a critical review of present knowledge with particular reference to the theoretical significance of the action and interaction of the drugs their indications and contra indications in treatment and the effects of their use on the functioning of the mental hospital. The group will also consider a suitable design for possible large scale studies in different countries and cultures.

#### Expert Committee on the Public Health Aspects of Water Fluoridation

WHO brought together in Geneva from 26 to 30 August 1957 a group of seven experts on water fluoridation whose task was to discuss the public health aspects of fluoridation and to submit a report on the subject.

Among the main topics discussed by the Expert Committee were the dental effects of fluoride where found naturally in water and where added the action of fluoride on tooth structure the safety of water fluoridation as related to water handling the metabolism of fluoride methods of adding fluorides to water and the fluoride compounds used the acceptance of water fluoridation by professional and public groups throughout the world.

The Expert Committee was made up of the following seven members: Professor Y. Ericsson (Stockholm) Dr Jean R. Forrest (London) Dr Paulo da Silva Freire (Rio de Janeiro) Professor A. J. Held (Geneva) Professor Harold C. Hodge (Rochester USA) Dr John W. Knutson (Washington) and Professor K. L. Shourie (Bombay).

#### Co-ordinated work of FAO and WHO on Brucellosis

The importance of brucellosis as a world problem is essentially twofold: first from the public health standpoint by reason of the illness, physical incapacity and loss of manpower caused by the transmission of the disease from infected animals to man, and secondly from the economic standpoint by

the loss to the animal industry entailed by the occurrence of the disease in animals. The latter is interlinked again with public health because of the serious diminution of needed foodstuffs, especially animal protein accompanying the financial loss.

In recent years considerable progress has been recorded in a number of countries in the control of animal brucellosis. But the disease in sheep and goats still remains one of the largest single public health problems of the zoonoses type in the Latin American, Mediterranean and Middle Eastern countries.

The control of brucellosis in sheep and goats will therefore be one of the major topics for study by the FAO/WHO Expert Committee on Brucellosis when it meets for its third session in Lima, Peru, from 9 to 14 October 1957.

In the interval since the Expert Committee last met in 1952, FAO and WHO instituted a programme of co-ordinated research covering the pathogenesis of brucellosis in sheep and goats, its diagnosis and the development of a vaccine for field use. The results of these studies, which were undertaken by the Veterinary Laboratory of the Ministry of Fisheries and Agriculture, Weybridge, England, the Pasteur Institute of Tunis and the Department of Bacteriology of the University of California, USA (the two first named act as FAO/WHO Brucellosis Centres) are also to be examined by the Expert Committee.

Also to be discussed are advances in laboratory diagnosis of brucellosis in man and animals, the therapy of human brucellosis, the use of vaccines for the prevention of brucellosis in humans, advances in the control of brucellosis in animals, the bacteriology and typing of *Brucella* and the work of the FAO/WHO Brucellosis Centres.

The members of the Committee will be: Dr M. Ruiz Castaneda (Mexico), Sir Weldon Dalrymple Champneys (United Kingdom), Dr S. S. Elberg (United States of America), Dr C. A. Manther (United States of America), Dr G. Renoux (Tunisia), Dr W. W. Spink (United States of America) and Dr A. W. Stableforth (United Kingdom).

The meeting will be preceded by the Fourth

Inter American Congress on Brucellosis which is also being held in Lima from 6 to 8 October 1957

The Pan American Sanitary Bureau WHO Regional Office for the Americas is arranging a short training course in the public health aspects of brucellosis and the control of the disease in animals intended for public health officials of the Latin American countries this course will take place immediately prior to the two meetings mentioned

### Data Sheets on Food Colours

Food colourings have been given first priority in WHO's efforts to collect information on the physical chemical pharmacological and other biological properties of individual food additives WHO has assumed this responsibility with the participation of FAO because the legislation of the various countries on food additives shows wide divergences and the size of the problem makes it impossible for any one individual country to undertake all the investigations needed

The information on food colourings gathered by WHO from all over the world has been incorporated in data sheets and the contents have recently been revised to take account of the comments and suggestions of WHO Member Governments The revised version is expected to be ready for distribution early in September 1957 It contains information in respect of 70 natural and 115 synthetic colouring materials—all of which with one exception are already in use or have recently been recommended for use in foodstuffs—including alternative and chemical names chemical and physical properties specifications and summaries of toxicity investigations published since 1930 The individual data sheets also list the countries permitting the use of the material in question and the whole is completed by a table listing all the colourings and the countries in which each one may be used

This document may be obtained by application to the Section on Health Laboratory

Methods World Health Organization Geneva

### Study Group on Schizophrenia

The frequency of schizophrenia makes it the most important of the public health problems in psychiatry All aspects of this disease—forms causes treatment procedures and preventive measures—were examined by a number of experts brought together by WHO early in September of this year The latest information available was put at the group's disposal and it is hoped that its report will clarify in what way WHO can be of assistance in seeking better answers to the manifold and as yet unsolved problems facing public health authorities

The meeting took place in Geneva and followed the Second International Congress on Psychiatry the main topic of which was also schizophrenia most of the participants in the WHO group first attended this Congress

The following took part Professor W von Baeyer (Federal Republic of Germany) Dr J A Boëk (Sweden) Professor Honorio Deleado (Peru) Professor M Gozzano (Italy) Dr Ernest Gruenberg (United States of America) Dr Nathan Kline (United States of America) Dr T A Lambo (Nigeria) Professor Aubrey Lewis (United Kingdom) Dr Chr Müller (Switzerland) Dr P Ratana-korn (Thailand) Professor Martin Roth (United Kingdom) and Dr P M Yap (Hong Kong)

### Help to Hungary in threatened poliomyelitis epidemic

According to information communicated to WHO the number of poliomyelitis cases recorded in Hungary in the first half of this year was three times higher than in preceding years This rise coming before the start of the usual polio season led to the anticipation of a possibly extensive epidemic against which urgent measures were necessary

The World Health Organization at the request of the Hungarian Minister of Health took immediate steps through its Regional

Office for the Americas (Pan American Sanitary Bureau) to obtain an export licence for Salk vaccine from the United States Government and a quantity of the vaccine sufficient to give 29 000 inoculations was delivered in Budapest late in July

WHO also collaborated with the Hungarian authorities in drawing up a plan for the vaccination programme. In order that the maximum benefit might be obtained from the use of the vaccine immunization was to be carried out in areas where the disease had not become widespread but where the epidemic might be expected to take root

In the epidemic years of 1947-1954 and 1956 the number of polio cases in Hungary rose from the usual level of 100-300 to as many as 1000-1200 children under five years of age accounting for the majority

#### Gamma globulin production in Poland

Some 80 000 cases of measles are reported annually in Poland. Outbreaks of this disease and of infectious hepatitis are common in day nurseries and other children's institutions and the country's present production of gamma globulin is still inadequate to combat these epidemics effectively

## People and Places

#### APPOINTMENT OF MALARIA ERADICATION DIRECTOR

In view of the need for WHO to concentrate for some time to come on work on malaria eradication the Director-General has decided that as from 1 July 1957 there will be a director of malaria eradication within the Headquarters Department of Advisory Services

Dr E. J. Pampana, who has been Chief of the Malaria Section of the Division of Communicable Diseases for a number of years past, has been appointed to this post. He will be responsible to the Assistant Director-General for advising on malaria eradication policies and techniques and for stimulating co-ordinating and directing the Organization's activities in this sphere. The Malaria Section will from the same date become responsible to him directly

A plan has been worked out and is now being put into operation by the Polish Government to double the present output—25-35 kg annually—by putting into production a new laboratory at Lublin. In this project UNICEF is to supply equipment which cannot be readily obtained in Poland and WHO is providing technical advice as well as fellowships for two Polish research and production chemists to study abroad

#### Public health laboratories in Indonesia

The Government of Indonesia has adopted a comprehensive plan to modernize the country's public health laboratories and improve the existing facilities for training of laboratory technical staff

In carrying out the plan the Government will have the co-operation of WHO. The funds allocated by WHO will be used to provide supplies and equipment to the Central Public Health Laboratory in Djakarta and the five provincial laboratories in Medan, Semarang, Jogjakarta, Surabaya and Makassar. The project will be conducted under the sole responsibility of the Government with technical advice and guidance from WHO

#### ORGANIZATIONAL CHANGES

The Division of External Relations and Technical Assistance at WHO Headquarters in Geneva has been disestablished with effect from 12 July 1957

Those of the Division's functions concerned with the Expanded Programme of Technical Assistance have been transferred to the Department of Advisory Services. Two additional Offices have been created within the Department of Advisory Services with broad functions regarding respectively the co-ordination of the Department's programme of work and evaluation of WHO activities

Dr O. Leroux is serving as Chief of the Office of Programme Co-ordination in addition to his responsibilities as Assistant to the Assistant Director-General in charge of the Department of Advisory Services and Dr A. Macchiavello has taken charge of the Office of Programme Evaluation

The functions of the disestablished Division concerning external relations remain the responsibility

of the Office of the Director-General and are being exercised through a newly established Office of External Relations. Mr Paul Bertrand is Chief of this Office.

#### WHO HEADQUARTERS

Dr René Sansonnens of Switzerland, took up duty on 15 July 1957 as Chief of the Section on Health Laboratory Methods of the WHO Headquarters Central Technical Services. He succeeds Dr G. Lofstrom, who has returned to his native country Sweden, on completion of his service with WHO to resume his former post of Professor of Bacteriology at the University of Uppsala.

Dr Sansonnens, after his earlier studies in medicine, specialized in bacteriology, tropical medicine and public health by extensive study both at home and abroad. Prior to joining the WHO staff, he was Assistant Technical Officer of the Swiss Vaccine and Serum Institute, Berne.

Dr R. A. Chapman, who has been responsible for WHO work on food additives since the start of the joint FAO/WHO programme in 1955, left the WHO staff on 19 July 1957. He is returning to his former position as Head of the Food Chemistry Section, Food and Drug Directorate, Ottawa, Canada.

Dr Chapman has been succeeded by Dr O. Isaac Nir-Grosfeld of Jerusalem, who was previously Director of the Israel Government Institute for Standardization and Control of Pharmaceuticals—a post he had held since 1944 and in which he had a wide responsibility under the Ministry of Health, in respect of food additives and the standardization of food products. Dr Nir-Grosfeld took up his new duties in Geneva on 1 August 1957.

#### ANAEMIA STUDIES IN MAURITIUS

Miss Dorothy Miley of Ireland, has recently arrived at the Island of Mauritius to take up her duties as the medical consultant on the WHO team that is already there. The team—whose complement is now complete with the arrival of Miss Miley—was sent out in 1956 in response to the request of the Government of Mauritius for the purpose of studying anaemia—one of the island's most important health problems. Dr G. Stott, the team haematologist, has already carried out a number of surveys and special studies with a view to establishing the etiology of the more prevalent types of anaemia in the island. Miss Miley's main task will be to study the characteristics of the diet and, in collaboration with Dr Stott, the relation between food intake and types of anaemia.

#### APPOINTMENT OF CONSULTANT ON AUTOMATION

WHO has secured the services of Mr Charles R. Walker, Senior Research Fellow of Yale University, USA, to help its Mental Health Section in the preparatory work for the forthcoming meeting to study the effects of automation on mental health (see above).

As a director of research at Yale's Institute of Human Relations, Mr Walker has studied the impact of technological change on human behavior over the past 10 years. He is a former President of the Society for Applied Anthropology.

#### MENTAL HEALTH WORK IN BANGALORE

In 1954 the Government of India established an All India Institute of Mental Health in the town of Bangalore in southern India, to provide postgraduate training for doctors and nurses and to carry out research in mental health problems in the area. WHO assisted in the work leading up to the foundation of the Institute by sending, in the latter part of 1951, a consultant to give the Indian Government expert advice on the development of the existing mental hospital and help in the setting up of the training institute. Since the opening of the Institute, WHO has provided two psychiatric nursing tutors and a specialist in electro-physiology to assist in the training programme.

More recently the Organization appointed a consultant psychiatrist, Dr O. M. Leberman of the United Kingdom, who was due to start work in the Institute on 1 July 1957. He will be primarily responsible for the neurological and electroencephalographic work but will take part, too, in the clinical and teaching activities. Dr Leberman, who has had previous Indian experience, studied electroencephalography at Dr Denis Hill's laboratory in the Maudsley Hospital in England and worked on urology during the Second World War. He has been given special leave of absence from the South-East Metropolitan Regional Hospital Board in London.

#### TEACHING OF PUBLIC HEALTH IN THE PHILIPPINES

Two new appointments have recently been made under the three-cornered agreement between the Government of the Philippines, the Johns Hopkins University, Baltimore, USA, and the World Health Organization, which came into operation in 1955, with the primary object of strengthening the teaching of public health in the Institute of Public Health of the University of the Philippines, Manila.

Dr Ruth A. Da is an instructor in child health, and Dr P. I. A. Hays

Office for the Americas (Pan American Sanitary Bureau) to obtain an export licence for Salk vaccine from the United States Government and a quantity of the vaccine sufficient to give 29 000 inoculations was delivered in Budapest late in July.

WHO also collaborated with the Hungarian authorities in drawing up a plan for the vaccination programme. In order that the maximum benefit might be obtained from the use of the vaccine immunization was to be carried out in areas where the disease had not become widespread but where the epidemic might be expected to take root.

In the epidemic years of 1947-1954 and 1956 the number of polio cases in Hungary rose from the usual level of 100-300 to as many as 1000-1200 children under five years of age accounting for the majority.

#### Gamma globulin production in Poland

Some 80 000 cases of measles are reported annually in Poland. Outbreaks of this disease and of infectious hepatitis are common in day nurseries and other children's institutions and the country's present production of gamma globulin is still inadequate to combat these epidemics effectively.

A plan has been worked out and is now being put into operation by the Polish Government to double the present output—25-35 kg annually—by putting into production a new laboratory at Lublin. In this project UNICEF is to supply equipment which cannot be readily obtained in Poland and WHO is providing technical advice as well as fellowships for two Polish research and production chemists to study abroad.

#### Public health laboratories in Indonesia

The Government of Indonesia has adopted a comprehensive plan to modernize the country's public health laboratories and improve the existing facilities for training of laboratory technical staff.

In carrying out the plan the Government will have the co-operation of WHO. The funds allocated by WHO will be used to provide supplies and equipment to the Central Public Health Laboratory in Djakarta and the five provincial laboratories in Medan, Semarang, Jogjakarta, Surabaya and Makassar. The project will be conducted under the sole responsibility of the Government with technical advice and guidance from WHO.

## People and Places

#### APPOINTMENT OF MALARIA ERADICATION DIRECTOR

In view of the need for WHO to concentrate for some time to come on work on malaria eradication the Director General has decided that as from 1 July 1957 there will be a director of malaria eradication within the Headquarters Department of Advisory Services.

Dr E. J. Pampana, who has been Chief of the Malaria Section of the Division of Communicable Diseases for a number of years past, has been appointed to this post. He will be responsible to the Assistant Director General for advising on malaria eradication policies and techniques and for stimulating co-ordinating and directing the Organization's activities in this sphere. The Malaria Section will from the same date become responsible to him directly.

#### ORGANIZATIONAL CHANGES

The Division of External Relations and Technical Assistance at WHO Headquarters in Geneva has been disestablished with effect from 12 July 1957.

Those of the Division's functions concerned with the Expanded Programme of Technical Assistance have been transferred to the Department of Advisory Services. Two additional Offices have been created within the Department of Advisory Services with broad functions regarding respectively the co-ordination of the Department's programme of work and evaluation of WHD activities.

Dr O. Leroux is serving as Chief of the Office of Programme Co-ordination in addition to his responsibilities as Assistant to the Assistant Director General in charge of the Department of Advisory Services and Or A. Macchiavello has taken charge of the Office of Programme Evaluation.

The functions of the disestablished Division concerning external relations remain the responsibility



# CHRONICLE or THE WORLD HEALTH ORGANIZATION

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Public Health Administration both faculty members of the Johns Hopkins School of Hygiene and Public Health have been seconded from their posts for tours of duty in Manila the former for one year and the latter for three months Dr Harper has been teaching at the Johns Hopkins School since 1947 Dr Davis served first as an assistant at the Babies Hospital of the Presbyterian Medical Center New York subsequently taking up her teaching post at the Johns Hopkins School in October 1956

#### STUDY OF FOOD PRACTICES IN MIDDLE EAST AND SOUTH EUROPE

Dr Walter L Mallman Professor of Bacteriology and Applied Microbiology at Michigan State University USA is to undertake on behalf of WHO a three months study of food practices in Iran Turkey and Yugoslavia, starting in August 1957 with the primary object of gathering the material for a simple manual of ways and means for raising standards of food hygiene The study will cover food borne diseases legislation on organization of and supervision of food hygiene and common food practices having a bearing on hygiene

Dr Mallman took his BSc and MSc degrees at Michigan State University—an institution with which he has been continually connected since 1918 apart from periods of post graduate study—and his Ph D at the University of Chicago Although his major interest lies in food hygiene Dr Mallman has won an international reputation in other aspects of environmental sanitation including water supply and sewage biology

#### TONGA ISLANDS—SOCIAL ANTHROPOLOGIST APPOINTMENT

An investigation of local customs and practices having a bearing on hygiene and sanitation of the environment is to be carried out in the Tonga Islands starting in September 1957 by Mr James Spillius of Canada He will be working as a member of a WHO team of public health experts that is to advise and assist the government of the islands in how best to conduct its health education programme Mr Spillius' duties will be to investigate the cultural social and other related customs of the Tongan people connected with personal hygiene living habits and sanitation of the family group environment

The Tonga Islands a British protectorate with an estimated population of 60 000 are situated in the Pacific Ocean east of Australia

Mr Spillius who has had a lengthy experience of social anthropology already has some knowledge of Tongan customs and habits Prior to taking up this

appointment he will be completing his thesis for a Ph D degree at the London School of Economics

#### WHO ENTOMOLOGY CONSULTANT

Dr Robert L Metcalf is at present engaged in visiting Italy Egypt Israel and Lebanon on behalf of WHO for the purpose mainly of advising the governments of these countries on the use of organophosphorus compounds in house fly control He will be giving particular attention to the possibility of the house fly developing a resistance to these substances

Dr Metcalf is Professor of Entomology at the University of California and Head of the Entomology Department at the Citrus Experiment Station Riverside California he is widely known as an authority on insecticides

#### APPOINTMENT OF VISITING PROFESSOR OF HEALTH EDUCATION INDIA

Dr Elizabeth Kelley of the USA has recently been appointed as visiting Professor of Health Education at the All India Institute for Hygiene and Public Health Calcutta She is to carry on the work begun by Dr Morey Fields in his two years' service in this post

This appointment is in line with WHO's policy of working for the strengthening of national institutes of public health so that training for leadership in national public health programmes may be carried out in the country of work instead of having to be taken abroad where conditions may be dissimilar

Dr Kelley has already served WHO in a similar capacity at the School of Public Health of the University of Malaya, Singapore from 1952 to 1954 Her recent work in her own country has been concerned with activities designed to improve school and community health programmes through co-ordination of the efforts of official health agencies and voluntary and other community groups

#### MENTAL HEALTH CONSULTANT

WHO recently called on the services of Dr J J Elkes Professor of Experimental Psychiatry at Birmingham University England to assist in its preparatory work for the meeting of a Study Group on Ataractic and Hallucinogenic Drugs which is to take place in November of this year (see above)

Dr Elkes will be leaving his present post later this year to take up a new appointment as Chief of the Clinical Neuropharmacology Research Center of the National Institutes of Mental Health Bethesda Maryland USA

## MAN'S SPIRITUAL AND SCIENTIFIC LEGACY FROM ROSS

*Extracts from an address by Dr M G Candau D. Sc. Gen. at  
the World Health Organization at the celebration at the Ross  
Institute London School of Hygiene & Tropical Medicine 13 June  
1957 of the hundredth anniversary of the birth of Sir Ronald Ross*

It is fitting that the World Health Organization should join in the celebration of the hundredth anniversary of the birth of Sir Ronald Ross. There is no need in this circle of admirers of Ross to recall in detail the essential phases of his glorious career as a malariologist. These I am sure are known to all of you. I am thinking of the years of painstaking labour Ross spent in India between 1895 and 1899 on his quest for the solution of the malaria problem and which led to the momentous discoveries of identifying the carrier and the way of transmission of the disease. I am thinking also of the three feverish years from 1899 to 1907 during which Ross spent the best part of his energy demonstrating in West Africa and in Egypt the practical value of his theory of control of malaria or as he put it "to apply the solution—to apply it immediately—to the saving of human life on the large scale."

Reading his memoirs recently I was struck by the admirable combination of simplicity, modesty, directness and unbiased confidence with which Ross described the great moments of his successful battle against what had for centuries been the most baffling and the most devastating scourge of mankind.

This is what he wrote when recalling the 20 August 1897 to which he later referred as Mosquito Day. We had to discover two unknown quantities simultaneously—the kind of mosquito which carries the parasite and the form and position of the parasite within it. We could not find the first without knowing the second nor the second without knowing the first. By an extremely lucky observation I have now discovered both the unknown quantities at

the same moment. The mosquito was the *Anopheles* and the parasite lives in or on its gastric wall and can be recognized at once by the characteristic pigment. All the work on the subject which has been done since then by me and others during the last 25 years has been mere child's play which anybody could do after the clue was once obtained. And this is what he wrote to Manson in July 1898 after his conclusive experiments with avian malaria. "I feel that I am almost entitled to lay down the law by direct observation and tracking the parasite step by step—malaria is conveyed from a diseased person or bird to a healthy one by the proper species of mosquito and is inoculated by its bite" and he added "The door is unlocked and I am walking in and collecting the treasures."

In saying this he was much too optimistic. As most geniuses in various fields of human endeavour Ross was ahead of his time and his truly revolutionary concepts were misunderstood or not adequately understood even by some of his closest friends. The fact is that some 50 years before the advent of DDT and other insecticides Ross established the basic principles on which the malaria policy of WHO was to be founded. In the first place he definitely recognized the need to concentrate efforts on prevention rather than on cure of the disease. "It is evident," he wrote in February 1899, "that the study of malaria has now entered on the third and last phase—prevention. That is we must find out how to exterminate the malaria bearing species of mosquito."

He believed that antimalaria activities could be successful only if conceived as an integral part of general sanitation work.

## SCHEDULE OF MEETINGS

2 8 October	Expert Committee on the International Pharmacopoeia Geneva
7 12 October	Study Group on Recommended Requirements for Biological Substances Geneva
7 12 October	Joint FAO/WHO Expert Committee on Brucellosis Lima
14 19 October	Expert Committee on Addiction Producing Drugs Geneva
14 26 October	Rural Health Conference New Delhi
16-29 October	Study Group on Social and Preventive Medicine Manila
21 26 October	Committee on International Quarantine Geneva
21 26 October	Study Group on Mental Health Aspects of Peaceful Uses of Atomic Energy Geneva
22 29 October	Joint FAO/WHO Expert Committee on Nutrition Rome
28 October 2 November	Expert Committee on Training of Health Personnel in Health Education of the Public Geneva
4 9 November	Study Group on Ataractic and Hallucinogenic Drugs in Psychiatry Geneva
4 15 November	Seminar on the Nurse in the Psychiatric Team Noordwijk Aan Zee Netherlands
6-13 November	Conference on Public Aspects of Air Pollution Milan
18 23 November	Expert Committee on Insecticides Geneva
18 23 November	Expert Committee on Air Pollution Geneva
25 30 November	Expert Committee on Professional and Technical Education The Introduction of Radiation Medicine into the Undergraduate Medical Curriculum Geneva
25 November 4 December	Seminar on Veterinary Public Health Warsaw
26 28 November	Fifth Borneo Inter-territorial Malaria Conference Labuan
2 7 December	Study Group on the Preventive Aspects in the Teaching of Physiology Geneva
2 20 December	Environmental Sanitation Seminar Zone II Singapore
9 14 December	Expert Committee on Health Statistics Sub-Committee on Cancer Statistics Geneva
11 13 December	Antimalaria Co-ordination Board Bangkok
13 20 December	Malaria Symposium Bangkok

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

# MAN'S SPIRITUAL AND SCIENTIFIC LEGACY FROM ROSS

*Extracts from an address by Dr M G Candlish, Director-General of the World Health Organization, at the Ross Institute Lecture School of Hygiene and Tropical Medicine 13 June 1957, for the 10th birthday of Sir Ronald Ross*

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He believed that antimalaria activities could be successful only if conceived as an integral part of general sanitation work.

The question he stated which is the best method for dealing with malaria in any place or country is a sanitary question to which medicine parasitology and entomology are ancillary. He recognized both the cost of malaria and the great economic advantages its elimination would bring not only to the region immediately affected but also to the rest of the world. For crowded areas he said by far the most economical measure now known to us is constant mosquito reduction (not necessarily extermination) practised as a part of ordinary sanitary work—not only for a month or a year but forever. It costs money of course but usually less than the sickness costs and far less than the other measures wrongly applied. Speaking to the Liverpool Chamber of Commerce on the political and economic meaning of his work he made that truly visionary statement. It may even happen that such a wild idea as killing mosquito grubs to prevent malaria may assist in giving to civilization the gift of another half a world—the tropics. We never know when we plant one of the seeds of science into how great a tree it may grow some day. And while on certain occasions he himself seemed to be dazzled by the magnitude of the opportunity created by his discoveries I submit that fundamentally Ross was a precursor not of the concept of control but of the eradication of malaria. It is indeed significant that the title chosen for his inaugural lecture at the University College of Liverpool was

The possibility of extirpating malaria from certain localities by a new method and while the meaning of the word extirpating can be questioned there can be no doubt whatsoever about the intentions of Ross when on his return trip to Europe in 1899 he projected on a world wide scale the experiments he had carried out in India and concluded by saying. In a few more months perhaps in a year or in two years the death dealing pests will begin to come under control will begin to diminish even to disappear entirely in favourable spots and with them slowly the ubiquitous malady would fly from the face of civilization—not

here or there only but almost throughout the British Empire—nay further in America China and Europe. Not disappear entirely of course (perhaps an impossible ideal) but be at least banished from the centres of civilization.

I am convinced that if Ross were alive today and if he knew the means and techniques available to the modern malariologist he would fight for the concept of eradication with the same vigour with which he advocated in his time the principle of control operations. To a very considerable extent therefore it was the spiritual and scientific legacy left by Ross that inspired the World Health Organization when in May 1955 it decided to take the initiative provide technical guidance and encourage research and co-ordination of resources in the implementation of a programme having as its ultimate objective the world wide eradication of malaria.

I am sure that he who repeatedly declared that help from outside could only be given in the form of what he called object lessons and that the main work must be left to the local authorities would have approved of the various forms of assistance through which WHO has been promoting control and eradication programmes in more than 50 countries or territories. I would like to mention in particular the holding of conferences and of meetings which in our experience is one of the most fruitful ways of disseminating technical information and of stimulating action both on country and on inter country levels. In the last few years around 15 conferences and meetings have been sponsored by WHO in practically all regions.

Regional malaria advisers and short term consultants employed by WHO play another important role in providing countries with the technical advice they need to solve their malaria problems. You may be interested in the new type of teams set up in 1956 known as malaria eradication advisory teams. These consist of a malariologist an entomologist and two laboratory technicians and are provided with transport and laboratory equipment. These teams which have already

visited Afghanistan Ceylon Iran and Taiwan are required to give guidance on a great variety of subjects such as the interruption of residual spraying operations the setting up of a surveillance system the question of using mass chemotherapy or chemoprophylaxis in addition to spraying operations. The teams may also deal with specific problems which arise when for some reason insecticides do not yield the expected results or when assistance is needed in the objective assessment of a given campaign. The *Anopheles gambiae* problem is being investigated by a special research and advisory team which makes use of all the classical methods and of cytogenetic methods and radioisotopes as well.

This brings me to the fundamental role research plays in all major activities promoted by WHO and in particular in those relating to the fight against malaria. I do not need to emphasize that efforts aimed at the world wide eradication of malaria must be supported by a well co-ordinated programme of research: the problems must be foreseen and studies must be initiated wherever possible before the problems themselves arise. The work of co-ordination in this field is WHO's basic responsibility and if the Organization is achieving a certain measure of success it owes this to the contribution of many individual members of the Expert Advisory Panels on Malaria and on Insecticides and of numerous research institutes which have been investigating a number of practical problems concerning the development of *anopheles* resistance to insecticides.

[One] essential line of investigation concerns drugs which while of little use in simple malaria control schemes are necessary in eradication programmes particularly in the final stages when a radical cure of remaining infections in the human population must be achieved. The administration of a sporonticide such as pyrimethamine to prevent infection of mosquitos could be a valuable complement to a residual spraying programme. We are now hoping to obtain the collaboration of suitable institutes in order to find out how long a simple dose of such a

drug could prevent the development of infective sporozoites in vector anophelines fed on gametocytes carriers.

The work undertaken under WHO sponsorship by the United States Public Health Service on administration of pyrimethamine or chloroquine in salt used in the daily diet has largely confirmed the results of Piyoth who originated this method using chloroquinized salt. The use of medicated salt for mass malaria prophylaxis may be a valuable method of control in certain special circumstances.

So much for the techniques WHO has been using to promote the cause of malaria eradication. The question which arises at this point and which I am sure you will expect me to answer is: what practical results have been achieved? Is malaria in fact being eradicated from the world? I believe that available records give an encouraging reply. At the end of March this year there were no less than 63 countries and territories in which eradication had been accepted as the goal of antimalaria activities. In 10 of these eradication had practically been achieved in 15 others eradication programmes were well advanced in 31 programmes had been initiated and in the remaining 7 they were in the planning stage.

These recent estimates made by Dr Paul Russell gave the population of malarious regions of the world as 1 070 280 000 680 361 000 or at least 57% of this population live in the 63 countries mentioned in which eradication of the disease can be expected to be achieved within a comparatively few years.

It can also safely be claimed that mortality and morbidity due to malaria are today not more than one third of what they were before the attack on the disease through the vector by means of residual insecticides began some twelve years ago.

In the Americas where all countries are now engaged in or committed to eradication programmes the disease has already been practically eradicated in the United States Chile Antigua French Guinea Martinique and Puerto Rico. Very good progress is

"The question" he stated "which is the best method for dealing with malaria in any place or country is a sanitary question to which medicine parasitology and entomology are ancillary." He recognized both the cost of malaria and the great economic advantages its elimination would bring not only to the region immediately affected but also to the rest of the world. "For crowded areas" he said, "by far the most economical measure now known to us is constant mosquito-reduction (not necessarily extermination) practised as a part of ordinary sanitary work—not only for a month or a year but forever. It costs money of course but usually less than the sickness costs and far less than the other measures wrongly applied." Speaking to the Liverpool Chamber of Commerce on the political and economic meaning of his work, he made that truly visionary statement "It may even happen that such a wild idea as killing mosquito-grubs to prevent malaria may assist in giving to civilization the gift of another half a world—the tropics. We never know when we plant one of the seeds of science into how great a tree it may grow some day." And while on certain occasions he himself seemed to be dazzled by the magnitude of the opportunities created by his discoveries I submit that fundamentally Ross was a precursor not of the concept of control, but of the eradication of malaria. It is indeed significant that the title chosen for his inaugural lecture at the University College of Liverpool was "The possibility of extirpating malaria from certain localities by a new method" and while the meaning of the word "extirpating" can be questioned, there can be no doubt whatsoever about the intentions of Ross when, on his return trip to Europe in 1899, he projected on a world wide scale the experiments he had carried out in India, and concluded by saying "In a few more months perhaps in a year or in two years the death dealing pests will begin to come under control will begin to diminish, even to disappear entirely in favourable spots and with them, slowly the ubiquitous malarial fever would fly from the face of civilization—not

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## TUBERCULOSIS

Statistics just published by WHO indicate that of all the infectious and parasitic diseases tuberculosis remains in the lead. Between 1950 and 1955 it accounted for three fourths of all deaths due to these diseases occurring after the age of 15.<sup>1</sup>

True BCG vaccination has some effect in reducing incidence but this measure however widely applied is not in itself enough to bring the disease under control. In vast areas of the world the control of tuberculosis may well eventually depend on the widespread use of cheap drugs for therapeutic and prophylactic purposes.

As is well known the development in recent years of the three techniques—immunization, chemotherapy and chemoprophylaxis—has led to the discarding of many of the traditional methods of control and has opened up the way for tackling this problem on a public health basis. But the difficulties are still manifold and WHO staff working in all corners of the world are constantly seeking the answers to many of the questions now being posed.<sup>2</sup>

In January of this year a number of tuberculosis workers met in New Delhi for an informal exchange of views, information and experience on all aspects of tuberculosis control. The meeting took place following the XVth International Tuberculosis Conference which was also held in New Delhi.

### Concept of tuberculosis control

The discussions ranged around three basic ideas that may be taken as the new concept of tuberculosis control.

The first of these concerns the attitude taken towards the disease itself. In the past, the social aspects of the tuberculosis problem have tended to be over-emphasized thus

engendering a passive approach to control in the face of poor living standards. But the basic fact to be kept in mind about tuberculosis is that it is a communicable disease the attack on which should be of the dynamic character appropriate to the control of all communicable diseases. The control measures instituted should be based on an intimate knowledge of the disease's epidemiology with a view to interrupting the natural course of events at the stage that will prove most effective. This in effect is the approach of WHO.

The second idea—that tuberculosis control today is no longer mainly a clinical problem but has become a public health problem and should be dealt with as such—was taken as a statement of fact. Attention was drawn however to the need of maintaining a proper balance between attention to the community and attention to the individual. It was recognized that this balance would necessarily differ in individual countries according to the prevailing social conditions.

Another question that came up concerned the extent to which clinical judgement is necessary in the diagnosis of pulmonary tuberculosis and the extent to which technicians can replace doctors in this work. The conclusion reached was that given the lack of doctors, technicians under medical supervision could well be entrusted with the carrying out of simple routine techniques.

The third idea emphasizes the need for reliable data to form the basis in planning control programmes and evaluating their results. In many of the countries receiving WHO assistance the statistics on tuberculosis mortality and incidence are not sufficiently accurate for this purpose.

### Tuberculin testing

The tuberculin test is still of importance in survey and diagnostic work in areas that

*Epidemiol. & S. P.* 1955, 10, 351-412 (N. 8)  
A collection of articles on problems will be found in  
*Bull. W.H.O.* 1955, 17, 151-340.



being made in other countries including Argentina British Guiana Guadeloupe the Canal Zone of Panama Tobago and Venezuela

In Europe malaria has ceased to be a problem in Corsica Cyprus and Italy At the Malaria Conference for countries of South Eastern Europe held in Belgrade three months ago it was announced that it was expected that no new cases of malaria would occur three years from now in Romania and in the USSR It is hoped that the same situation will obtain in Bulgaria within approximately five years Eradication programmes are also under way in Albania Turkey and Yugoslavia and despite the development of resistance in vectors Greece is well on the road to achieving eradication We hope that Portugal and Spain will very soon undertake similar programmes

In the Eastern Mediterranean Region excellent progress is being recorded in the Lebanon Work has also started in Iran Iraq and Syria while for Egypt Israel and Jordan the programmes are now in the planning stage

In Asia the Antimalaria Co ordination Board established for Burma Cambodia Laos Viet Nam and Thailand will accelerate operations in all these countries Thailand is already approaching its goal of eradication This is also true of Ceylon and Taiwan while a good start has been made in Afghanistan the Philippines and India The latter country with the largest malaria problem in the world since it includes around 300 million people exposed to the risk of the disease is now planning to convert its national malaria control organization into one aimed at eradication by stages

Progress is of course less spectacular in Africa although in this part of the world too eradication has been achieved in Mauritius while the programmes are quite well advanced in both La Reunion and Swaziland However in Africa the intensity of transmission is greater than anywhere else in the world and there are specific technical problems to solve Therefore while control schemes some of them covering large areas are being undertaken in many African countries and territories it is necessary that intense field studies be undertaken in pilot testing zones within these schemes There is no reason to suppose that with this kind of approach the answers to those problems cannot be found nor that the use of insecticides perhaps coupled with chemotherapy will not be crowned with the success it has known elsewhere

As you can see we have gone a long way on the road which the discoveries of Ross opened up for us some 60 years ago I can think of no better way to honour the memory of Ross than to recall the remarkable victories achieved all over the world against his arch enemy the malaria carrying mosquito I wish he could have lived long enough to see how in the Terai an area well known to him where the first WHO demonstration team operated malaria was brought under control and large resettlement schemes were established And what would have been his satisfaction to know that India the country where he did the outstanding work for which we honour him today has been actively engaged for the last few years in a national programme which is now oriented towards the complete eradication of malaria

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### ***Deratting and Deratting Exemption Certificates***

A supplement to WHO's *Weekly Epidemiological Record* (No 36 1957 Suppl 3) contains a list of the ports approved and designated under the International Sanitary Regulations for the issue of Deratting Exemption and/or Deratting Certificates as on 6 September 1957 together with information on conditions and facilities for deratting at a number of the ports mentioned Any future amendments to this list which covers ports in 95 countries and territories will be published in the *Weekly Epidemiological Record*

a community should be continued until all excreted bacillary strains become resistant

Some doubt was apparent on whether even assuming better results the extra cost involved in combined chemotherapy is justified

WHO in continuing to recommend the use of INH alone in its field studies takes account of this economic factor. In the meantime the Organization is endeavouring to obtain as much information as possible from sources all over the world on resistance of tubercle bacilli to INH since it is on this factor that the success or failure of the mass attack on tuberculosis as at present conceived may depend

### Prevalence surveys

The meeting was firmly of opinion that the only reliable means of obtaining the data needed as a basis for the planning of control programmes is by the prevalence survey. As has already been said available statistics on tuberculosis mortality and incidence are often not sufficiently accurate for this purpose

The prevalence survey consists of selecting a population by random sampling methods and examining if possible every member of it. Any groups coming within the sample that may be inaccessible should be well defined and their numbers excluded from the calculations so as to avoid a bias in the final estimates. Definitions and operational rules must be laid down before the survey starts as well as procedures to be adopted and types of examinations to be made together with a definite allocation of responsibility for every operation involved

An initial pilot survey is essential in order to determine the sample population size to try out the records system and to train operators. The services of a trained statistician are needed from the outset to ensure that the survey will yield reliable results

### Execution of control programmes

For economic and technical reasons it is seldom possible for a country to attack the

tuberculosis problem in all parts of its territory simultaneously. The meeting therefore favoured division into areas of high medium and low prevalence so that efforts can in the first instance be concentrated where they are most needed

This idea has already been put into practice in India. The attack is being focused on the cities where prevalence of the disease is highest. At the same time BCG vaccination is being carried out in the areas of lower prevalence. The other countries of the South East Asia Region have been encouraged by the efforts in India to envisage prevalence surveys and WHO will probably provide the necessary technical help

### Control methods and techniques

Two ways for attacking tuberculosis on a mass scale were described. The first consists of establishing local centres with facilities for diagnosis and treatment. The second is to use mobile teams to carry out mass miniature X ray examinations for case finding followed up by domiciliary treatment

No attempt should be made at establishing fine diagnostic criteria. The results should be classified merely into two categories normal and abnormal. All persons coming within the latter group should be given treatment. Cases with lesions visible by X ray should be treated over a period of one year after which a check up by sputum examination and X ray can be made to determine whether further treatment is needed. The fact that no detailed clinical diagnosis has been made need not delay treatment since chemotherapy causes the minimum of interference with the normal life of the patient

A mobile X ray unit should be able to make about 40 000 examinations a year out of which some 1000 cases might be found. One home visitor at an average of 20-25 visits per working day should be able to take care of some 100-120 homes

Doubts were expressed about the feasibility of this second scheme which is advocated by the WHO Headquarters services. Some of the participants thought the treatment at

have not previously been covered by BCG vaccination campaigns

There was general agreement that the Mantoux test with 5 T U PPD should be continued as the standard method for tuberculin testing and that where assessment indicates the occurrence of non specific sensitivity a borderline of 10 mm induration is probably the most effective one for selection of persons for BCG vaccination

The Tuberculosis Research Office in Copenhagen (which is part of the WHO Headquarters services) is continuing its efforts to find an effective means of maintaining the stability of tuberculin dilutions—a prerequisite to standardization of the product

### Examination for tubercle bacilli

Demonstration of tubercle bacilli by culture following the discovery of X ray pathology in the lung is the meeting agreed an adequate diagnostic method and its recommendation by WHO is very proper Nevertheless governments find it difficult on economic grounds to act on this recommendation The alternative of direct microscopic examination of sputum after staining by the Ziehl Neelsen method is simple cheap and speedy but is subject to a wide margin of error The Tuberculosis Research Office is engaged in determining optimum methods for sputum collection and slide examination and is studying the possibilities of direct microscopy as against culture of the bacilli

If national tuberculosis services are to be widely expanded it will be necessary the meeting considered to rely to a great extent on direct microscopy This should be subject however to constant check against culture results from specimens selected by random sampling methods It was also thought that the possibility of consistently high quality culture work at lower cost could be brought about by centralizing media production within a country

In connexion with the experimental work on standard methods arrangements have been made with four leading laboratories in Europe and one in the United States of

America to have sputum specimens from various countries examined with a view to typing and studying the characteristics of the tubercle bacilli found

### BCG vaccination

A conference of BCG vaccine producers from about 30 countries which took place in Geneva in October 1956 came to the conclusion that evaluation of the potency of BCG vaccine must be based on the degree of allergy produced in children There is definitely some correlation too between the degree of allergy and the degree of protection produced Work at the Tuberculosis Research Office has shown that allergy production took from 8 to 10 weeks in new borns as against 4 to 6 weeks in older children The high proportion of complications found in new borns following BCG vaccination is mainly due to faulty vaccination techniques At present however the use of oral vaccination is not recommended by WHO because of lack of controlled investigations

The incidence of low grade non specific sensitivity in a population can—it was stated—be demonstrated by special tuberculin testing techniques The prevalence of non specificity is a determining factor in selection of persons for vaccination It is now thought that there is some evidence that low grade sensitivity gives some protection against infection

### Chemotherapy in tuberculosis

Two distinctly opposing views emerged from the discussion on chemotherapy One body of opinion holding that developed resistance to isoniazid (INH) has the same importance as resistance to para aminosalicylic acid (PAS) or streptomycin advocated combined chemotherapy against tuberculosis The other school of thought regarded resistance to INH as comparatively unimportant and was in favour of single drug therapy The extreme of this view was that INH treatment of tuberculosis cases in

## RESULTS OF THE YAWS CAMPAIGN IN NIGERIA, 1956

Nigeria is a large country on the west coast of Africa approximately 600 miles square in size. It is divided into a northern two thirds (Northern Region) and a southern third. The latter is roughly divided in two the Western and Eastern Regions. The total population is about 31 million with about 17 6/7 and 8 million respectively in the Northern Western and Eastern Regions. Yaws occurs in a large area with its highest prevalence about the point where the three regions meet and extending south west and east.

### Reduction in yaws prevalence

In 1956 over a million persons were examined and treated during initial treatment surveys in the Nigerian campaign and a population half as large again was covered during resurveys. The yaws campaigns in Nigeria and the British Cameroons have been very closely related throughout.

The total cumulative figures up to the end of 1956 are 2 565 000 for initial treatment

surveys and 2 028 000 for resurveys. At the initial treatment surveys a high percentage of the population is examined (86 2/3). In addition to seeking and treating yaws other medical work is undertaken such as looking for leprosy and sleeping sickness and taking the necessary action to have patients treated. Smallpox vaccination is also carried out.

The Governments of the three regions are in many ways independent of the Federal Government sited in Lagos. The yaws activities are similarly divided into separate campaigns. The campaign which in some ways might be regarded as the most favoured is the one in the Eastern Region<sup>1</sup> with a population of about 8 million. This has developed more fully than the others perhaps because it is near the capital city of the Region Enugu and also because of certain favourable conditions including high density of population good roads permitting all villages to be reached by car the relatively short distances of the villages from the headquarters of the units the possibility of

<sup>1</sup> Prepared by the Venereal Diseases and Treponemaloses Section World Health Organization, Geneva.

<sup>2</sup> Further details of the project will be found in *Bull. Wld. Hlth. Org.* 1956, 15: 911-935.

TABLE I. POPULATION AT RISK AND PERSONS EXAMINED AND TREATED TO END OF 1956

Region	Population (millions)	Population at risk of yaws (millions)	Persons examined and treated (millions)
Eastern Region	8	7.2	1
Western Region	6.5	5	1
Northern Region	17	2.5	0.5
British Cameroons	1.4	0.8	0.09
Total	31.9	15	2.9

The figures in this table are preliminary and are subject to revision. The figures are based on the results of the initial treatment surveys and the resurveys which are being carried out in the Eastern Region.

least would have to be carried out by home visitors operating from fixed centres. But it was explained that the idea behind the scheme is to ensure that work is started without delay in areas of high prevalence where district centres do not as yet exist.

## Personnel

The shift of emphasis in tuberculosis control from the clinical to the public health approach has necessitated a change in the qualifications and experience needed in a medical officer dealing with this disease. He needs to be trained in sociology and public administration, epidemiology including research statistics, communicable diseases with emphasis on bacteriology and tuberculosis control in all its aspects (planning, organization and execution of control campaigns and the relevant technical considerations). This list met with the full approval of the participants.

It may be recalled in this connexion that the WHO Expert Committee on Tuberculosis has recommended that institutes be set up in each of the WHO regions where training in all these branches may be given.<sup>2</sup> So far it has not proved possible to put this into practice.

With regard to staff for domiciliary visiting the view was expressed that where little bedside care is needed, home visitors with one year's training in nursing and two years' training in social work are better for this purpose than trained nurses.

## WHO activities

One of the objectives of the meeting was to refresh the participants' knowledge of WHO's approach to this problem and to give them a comprehensive view of the many-sided activities covered by the Organization's work on tuberculosis.

The basic aim of all WHO action is to assist national health authorities to make the

maximum impact on the tuberculosis problem in their respective countries. For purposes of description, two main categories of activity may be distinguished under the titles of direct and indirect assistance to governments.

The first of these direct assistance takes a variety of forms which may be grouped under the following general headings: general advice in tuberculosis control; field projects for demonstration, training and teaching purposes; training of national staff to carry on the work through fellowships and teaching and training courses. This work comes under the WHO Regional Offices.

Indirect assistance, on the other hand, is the responsibility of the Headquarters services which are mainly concerned with the study of problems in diagnosis and methods and techniques for treatment and control of the disease.

This work has many facets. Some of the research being undertaken by the Tuberculosis Research Office has already been mentioned above. It is noteworthy that the Office's efforts to work out standards for tuberculin testing in mass surveys are nearing completion and its work is being actively pursued on the devising of standard techniques for tuberculin testing, sputum examination and interpretation of X-ray examinations, as well as standard methods for selection of individuals for examination in sample surveys.

Of a different character are the attempts to get makers to produce simple and less expensive X-ray equipment adapted for use in tropical areas.

Another aspect is concerned with making generally available the experience gained in tuberculosis control in individual countries. In order to draw the maximum benefit from the lessons learned, it is recognized that results should be comparable on an international basis. The Headquarters services have been called upon to devise standard methods and techniques for control operations that can be used everywhere, thus ensuring a higher degree of comparability than is at present possible.

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W s <sup>1</sup> R g	6.5	5	1
N rth R g	17	2.5	0.5
B rish Cam oon	1.4	0.3	0.09
T o t a l	32.9	15.5	2.9

Th s f g a op m s d d h e c k i g b y m p l r e v s w h h r e b e r g m d i t l p b l e t h t  
i m s i l t h f i c t e d a r t h p i l e t l i l g a c t y w i l w

field work all the year round and excellent co operation (including financial participation) from the local authorities and the people. Since the beginning of operations able and active WHO Senior Medical Officers have played an important part in gathering together the loose ends of the campaigns and co ordinating the work. Preliminary surveys have also been made of populations where the frequency of yaws is less well known so as to obtain data to guide the planning for developing the campaign. The stage is being reached when most of the areas where the prevalence of total clinically active yaws was over 10 % will have been dealt with and be in the later stages of resurveys. In the Eastern Region the work is becoming integrated into the activities of the newly built rural health centres. In the other Regions where rural health centres are not so developed resurveys may have to be continued longer until some adequate and economical form of surveillance can be established in the areas concerned. At resurveys only patients with active disease and the contacts of infectious patients are treated.

Where the prevalence of clinically active yaws is over 10 % in addition to the treatment of all active cases the remainder of the population is given half doses as latent cases and contacts. Following this total mass treatment great reductions in the prevalence of active yaws are found at resurveys six and twelve months later. This has been measured in the Eastern and Western Regions and in the Cameroons by the changes in prevalence of infectious cases. Falls from a maximum of about 7 % of infectious cases (in the population examined) to under 1 % have been usual after six months and further decreases have generally been found after twelve months (see Fig 1 p 311). This represents the almost complete breaking of transmission so that new infections of yaws in children are very scanty or absent.

The achievements as indicated by the data for 1956 are reduction in total active yaws from 17 % to 0.7 % reduction in infectious yaws from 5 % to 0.36 % total number of persons examined at initial treatment surveys

1 000 996 and at resurveys 1 563 568. It must be stressed that the data are from all Regions and that the resurvey data do not necessarily refer in all instances to the same population as the initial treatment survey data.

Late and non infectious cases are of course also treated at the initial surveys and these too become greatly reduced. Such cases occur generally in adults and as in many places they most frequently affect the palms of the hands and soles of the feet another benefit of the campaign is immediately seen in a peasant population which cultivates the soil with hand tools. The resulting increased food production has widespread significance for the family with out any obvious great increase in population because yaws is not a killing disease.

The decrease in late ulcers may also have epidemiological importance in the later stages of an anti yaws campaign because there is some evidence that though not highly infectious they may be slightly so. Dr F Nery Guimarães has recently stated in an unpublished work that he has infected human volunteers with material from such ulcers.

### Development of rural health services

There is abundant evidence of the immediate benefits of total mass treatment and there are good reasons for adopting this policy when the prevalence of yaws is high. The people themselves are impressed by the disappearance of yaws and in the Eastern Region the combination of a progressive people and wise advice has resulted in the development of a rural health service based upon rural health centres in the areas where the campaign has been carried out. These centres and the co ordinated service had been independently planned before the campaign began but lack of regional funds had prevented their implementation.

Following the mass treatment phase of the yaws campaign the locally-elected district councillors that is Africans elected by African villagers voted money to build and partly staff these rural health centres. The Eastern Region Government undertook to





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future in their approach to national independence

### The future

International help is continuing and may be needed for several more years for there are still many problems to be solved for instance what should be done in areas where at present the establishment of rural health centres is not practicable and how the large areas of low prevalence can be most effec-

tively and economically dealt with by means other than total mass treatment. In connexion with the latter and increasingly in connexion with the later stages of anti yaws campaigns criteria of the presence of yaws other than visible clinical manifestations are needed. It would appear that sample serological surveys offer the best possibilities and WHO is interested and active in seeking a simple test requiring inexpensive equipment and a small quantity of blood from each person for this purpose.

## HEALTH EDUCATION IN AFRICA

Modern medicine is increasingly aware of the importance of discovering and eliminating factors of the environment that can injure the maintenance of the total well being—physical, mental and social—which is health. This relatively new concept makes health education one of the essential elements of public health work since health education is largely directed towards the betterment of the environment. Nowadays it is generally accepted that the collaboration of the people is a prerequisite to success in health programmes of all kinds. This collaboration cannot be secured by the mere passing of legislation, however admirably conceived in itself.

These views were put forward at a Seminar on Health Education organized by WHO and held in Dakar, French West Africa, from 25 to 30 March 1957 for the countries of the WHO African Region. The purpose was to create an opportunity for joint discussions on the development of health education in the Region and for study of ways and means of integrating this in public health programmes.

In Africa, ancient traditions, long standing customs and the distrust of innovations brought into the villages from outside all stand in the way of progress. And Africa is a continent of villages, ravaged by the forces of nature and climate and subject to most of

the major ills of mankind. To help the people to help themselves is therefore a major preoccupation of the health authorities of the diverse countries and territories in this Region.

### Common problems

One basic task in health education is to teach the people to make use of such existing health services as hospitals, clinics, rural health centres and mobile units used in special campaigns against specific diseases. But poor communications and transport facilities, lack of trained personnel and a high rate of illiteracy among the population are common factors that limit efforts in this direction. An overriding limitation in the poorer and more remote areas is financial stringency.

### Development of health education

There was support in the Seminar for the view that health education should be the responsibility of the government, preferably exercised through the national health authorities. In view of the importance of financial issues, the greatest stress was laid on the co-ordination of health education efforts among all the branches of government concerned—

subsidize these undertakings and to provide certain staff on the condition that the centres conformed to certain standards the general bearing of which was that their work was to be taken into the villages and to be of a preventive and supervisory kind and that they were not to become completely occupied with curative treatment often of unimportant complaints such as coughs and colds abrasions etc By the end of 1955 seven such local health centres had been established in the division of Nsukka which has a population of 450 000 By the end of 1956 there were eight district health centres and several more are planned

The yaws scouts simply trained village youths who have been responsible for the field work of the resurveys are being further trained for wider public health activities as multi purpose health visitors attached to the health centres at the rate of roughly one per 10 000 population Each health centre will cover 50 000 60 000 people The district councils have voted money for this further training

So satisfactory has the Nsukka Division rural health scheme proved that it is being developed into a demonstration and training area for the training of staff for other rural health units throughout the Eastern Region of Nigeria where other rural health centres are already planned

Thus it will be seen that the two main purposes of an anti yaws campaign have been admirably achieved in one division of Eastern Nigeria The first is the great reduction in the prevalence of active yaws in the area of the campaign—that is it is no longer an important disease and there is every prospect that its eradication will soon be achieved through the surveillance system set up The second purpose is to improve the health and standard of living of the people This has been brought about through an awakened activity of the people themselves in recognizing the need and assuming the responsibility for the establishment of rural health centres with a higher standard of work than the previous dispensaries and with wider public health activities

There is every possibility that with further sound advice and assistance this awakening will spread to other than medical fields and the standard of living will develop along lines suited to the people

### International assistance

At practically all stages of these extensive operations the excellent work of the Regional Government officers has been assisted by advice from WHO and by essential supplies from UNICEF

### Assessment

It is reported that in 1956 the cost per person examined at initial treatment surveys and resurveys was US \$0.13 and for each person treated US \$0.33 The PAM dosage

TABLE II EXPENDITURE ON YAWS PROGRAMME  
NIGERIA 1956

	US\$
Technical Assistance	
WHO	10 000
UNICEF	70 000
Federal Government of Nigeria	
Eastern Region	90 000
Western Region	90 000
Northern Region	80 000
British Cameroons	30 000
Total	370 000

UNICEF's total contribution since the start of the programme amounts to over half a million US dollars

used is that recommended by WHO in which the dose for a patient with clinically active disease is 1.2 mega units (4 ml) There is every reason to believe that the money spent from international funds has together with national expenditure (see Table II) produced very satisfactory immediate results and has awakened an activity in the people themselves that will play an important part in the

health activities. The remaining categories are all in close touch with the people and have constant opportunities of using the health education approach in their work.

In view of these recommendations the Seminar felt there was no need for the creation of a junior grade of auxiliary health educators at the present stage of development of most of the African territories.

On the question of programme and content of training the point was made that these should always be under the control of professional medical personnel. Moreover the emphasis should be different in the courses for staff responsible for planning and policy in health education and for those carrying out the actual work in the field.

Attention was also drawn to the need for reviewing medical training at all levels with the object of inculcating special interest in public health problems from the outset. Thus

would help to build up the public health workers so greatly needed in the rural areas.

Periodic and refresher courses for medical and auxiliary personnel already in service were also advocated.

### Methods and media

Experience in the use of the divers techniques and audio visual aids used in educational work has varied widely among the different countries. A technique found of value in one has proved a failure in another. But whatever the media preferred there was unanimous support for making the utmost use of audience participation and for drawing on local lore and familiar illustrations in preparing spoken and recorded material. Indeed the active participation of the people themselves should be taken as the overriding criterion in estimating the value of any technique.

## THE WIESBADEN CONFERENCE ON HEALTH EDUCATION

The health worker's role in health education is to help people to "achieve health by their own actions and efforts".<sup>1</sup> How health workers—doctors, nurses, public health administrators and others—may be trained in health education, why they should work in close harmony with each other and what methods they should use in their contacts with individuals, families and the general public were some of the questions discussed at the Conference on Health Education held at Wiesbaden from 27 June to 5 July 1957 under the auspices of the WHO Regional Office for Europe.

Although this was a specifically European conference attended by European experts whose chief concern was the development of health education in their own countries it became apparent that the problems they encountered were similar to those in other parts of the world. The need to integrate health education in public health programmes

was felt as keenly in Africa, for instance, as in Europe. To judge from the views expressed at the recent WHO sponsored Seminar on Health Education held in Dakar, French West Africa, earlier this year (see article on page 313).

As stated in the opening address, health education is not directed towards one particular section of the community nor to any one age group. It is of importance to people throughout their lives, from childhood to old age, and should be given by every available means and by all those called upon to guide and educate. Teachers are necessarily included in this group and keen interest was expressed at the conference in the teaching of health education in schools. This aspect of health education was not within the purview of the conference but several participants expressed the hope that it would be discussed at some future meeting.

It was generally agreed that health education had become an indispensable part of medicine. Diagnosis, treatment and reha-

<sup>1</sup> *Report Comm. H. H. Educ. on F. H. Public* (1954)  
*W. H. O. J. Org. Am. R. P. Ser. B.*

education social welfare agriculture and public works as well as health. Voluntary agencies likely to exert some influence among the people should also be drawn in.

Up till recently medical services in Africa have been largely concentrated in the towns. Services for rural areas should now be further developed and the need for closely allying health education work with this expansion was considered imperative.

Timing of efforts and the choice of appropriate targets were also regarded by some of the participants to be of primary importance for securing the maximum benefit from health education activities. In such a vast continent the emphasis in public health work varies widely. Often however public health operations start with mass campaigns against the major endemic diseases. At this stage health education can bring the people to recognize other public health needs and thus lay the groundwork for the growth of some form of community development.

### Social and cultural factors

A deep knowledge of the social and cultural context of a people—and especially of their attitude to health and social problems—is of the utmost importance for carrying out public health measures and is essential for eliciting popular support for these. The need for the co-operation of the people in Africa is all the greater because of the lack of qualified personnel for direct public health work, the heavy cost of curative medicine—necessitating as it does greater emphasis on preventive measures—and the continual drain on national resources in fighting the endemic diseases. Since the present knowledge of African populations is far from adequate the Seminar strongly advocated study of local social groups to be carried out by anthropologists with a view to determining the best approach in all health activities educational and otherwise. This would help it is believed to eliminate the costly mistakes of the past where the method of presentation of certain programmes failed to elicit the support of the public.

### Role of schools

There was divergence of view on the effectiveness of the health education work carried out by the schools. The point was made that frequently the curriculum needs to be revised so as to relate the teaching more closely to the needs of rural life. Moreover where schools are sparse health education must be done outside them through groups of influential men and women. Another view advanced was that health education should be an integral part of fundamental education. All primary school teachers should be given training in the subject.

### Mobile health units

The possible uses of mobile health units were also a matter of divided opinion. One view was that they serve to popularize recourse to curative medicine so educating the people in medical care as understood elsewhere and form a useful link with the fixed rural health centres. On the other hand it was maintained that fixed centres alone can ensure lasting and effective health education in the course of their curative and preventive work. These are the permanent points from which health education can reach out to a wide circle of villages with great effect.

### Training

There was general agreement that apart from the professional staff centrally responsible for health education some instruction in health education should be given to the following types of personnel either in the basic training or at a subsequent stage: medical personnel including physicians, nurses and midwives; auxiliary medical personnel; social workers; medico-social assistants; local midwives; schoolteachers; home economists; community development and fundamental education workers. Training of this kind for all physicians, nurses and midwives is of primary importance because being in positions of authority they can influence the emphasis given to health education in all

FIG. 1. POPULATION PER PHYSICIAN

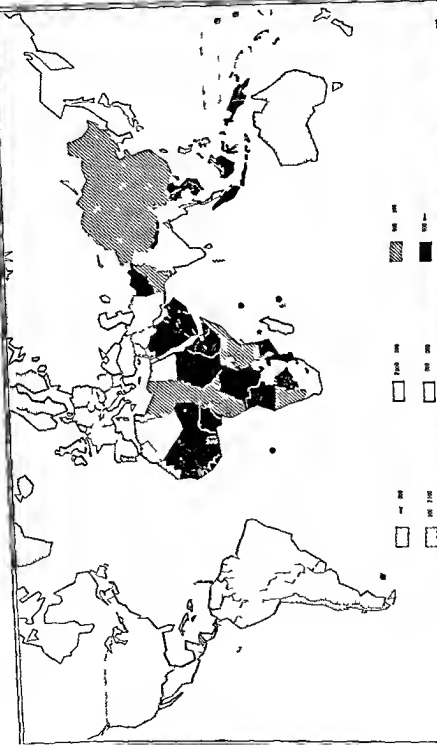


TABLE 1 MEDICAL SCHOOLS AND PHYSICIANS (WORLD FIGURES)

Area	Population	Number of medical schools	Number of physicians	Annual number of medical graduates	Population per medical school	Population per physician	Annual number of medical graduates per 1000 physicians	Population per new physician i.e. annual graduate
Africa	210 832 000	16	23 84	1 089	13 177 000	9 055	49.8	194 000
North and Central America	234 276 000	124	259 664	9 076	1 889 000	902	35.0	28 000
South America	121 000 000	53	48 763	5 308	2 283 000	2 507	110.0	23 000
Asia Eastern	130 821 000	171	209 68	12 49	8 018 000	6 537	59.2	110 000
Asia Western	82 790 000	15	16 951	668	5 614 000	4 869	51.0	95 000
Europe	619 707 000	53	665 22	31 222	2 449 000	931	55.8	17 000
Oceania	14 234 000	6	12 427	741	2 372 000	1 145	59.6	19 000
World total (or all)	2 653 397 000	638	1 235 799	66 722	4 160 000	2 147	54.0	40 000

Figures rounded off to nearest thousand

FIG 1 POPULATION PER PHYSICIAN

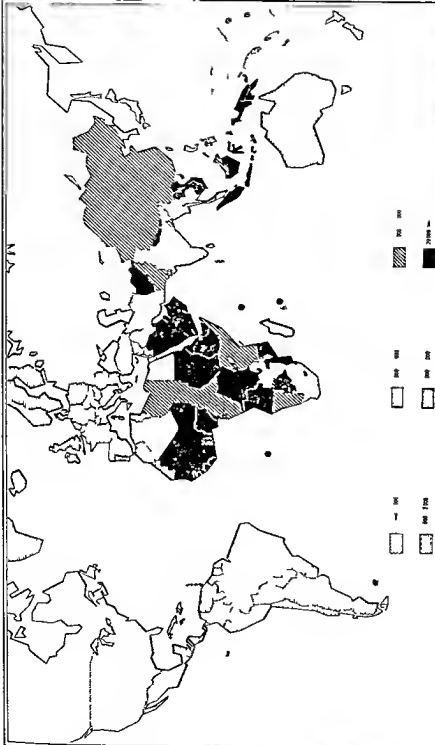




TABLE I MEDICAL SCHOOLS AND PHYSICIANS (WORLD FIGURES)

Area	Population	Number of medical schools	Number of physicians	Annual number of medical graduates	Population per medical school	Population per physician	Annual number of medical graduates per 1000 physicians	Population per new physician in the annual graduate
Africa	210 832 000	16	23 84	1 089	13 177 000	9 055	46 8	194 000
North and Central America	234 276 000	124	259 664	9 0 6	1 889 000	907	35 0	26 000
South America	121 000 000	53	48 53	5 309	2 283 000	2 507	110 0	23 000
Asia, Eastern	1 370 871 000	171	203 588	12 418	8 015 000	6 37	9 2	110 000
Asia, Western	82 529 000	15	16 951	968	5 614 000	4 869	51 0	95 000
Europe	619 707 000	253	685 522	37 222	2 449 000	931	5 8	17 000
Oceania	14 234 000	6	12 427	741	2 372 000	1 145	59 6	19 000
World total (to date)	2 653 393 000	638	1 235 799	66 722	4 160 000	2 147	54 0	40 000

Figures rounded off to nearest thousand

of hospital work immediately following graduation (b) work undertaken at a hospital during the pre-clinical period or (c) hospital work undertaken by the student during the clinical period. Whilst the amount of time spent in either of these varies according to the different systems in operation the term "internship" applies in most cases only to hospital work carried out after graduation (a). The other two periods are known generally as those of clinical clerkship (*stage de l'étudiant hospitalier*). In some countries hospital service after graduation a period

of service in a rural area or service in some other specified type of medical practice are required before independent practice is permitted. This compulsory period is included under the general heading of "internship".

The second edition of the *World Directory of Medical Schools* has considerably enlarged the extent with figures necessarily revised since the first publication of the information available to those engaged in medical education. The material will consequently enable assessments and comparative studies to be made over a wide field.

## Reports of Expert Groups

### MALARIA ERADICATION

The sixth report of the WHO Expert Committee on Malaria<sup>1</sup> is devoted to the technical and administrative principles as well as the practical aspects of malaria eradication. It may be regarded as a guide for drawing up programmes and selecting methods intended for the use of the malaria control services of the continually increasing number of countries which have adopted the eradication policy advocated by the World Health Assembly.

After defining malaria eradication which should not be confused with eradication of the disease vector and showing that it differs radically in many respects from mere malaria control the Committee proceeds in this report to an analysis of the theory of eradication dealing in particular with the organizational problems raised by the detection of residual foci, the role of immunity in the development of epidemics, the epidemiological factors which influence the re-introduction of the disease or its renewal from small origins (origin of the epidemic, multiplication rate of cases and potential severity of the epidemic), the criteria of

malaria eradication and the requirements to be met by a malaria control programme in order to be recognized as a step towards an eradication campaign.

With current techniques and the considerable funds made available to governments by international organizations the cost of an eradication programme is generally not beyond the financial possibilities of most countries. It seems therefore that efficient management at all levels is the factor which requires the greatest emphasis. Consequently the report devotes considerable space to the various administrative aspects—previously somewhat neglected—encountered in any eradication programme e.g. legislation, organization of national malaria services, budget and management of finances, functions of personnel of all grades, training of professional and non professional groups, consolidation, maintenance.

The same desire to provide a detailed guide based both on experience and on the most recent advances is shown in the discussion of the other phases and aspects of the programme e.g. the spraying campaign, prevention of breeding, drug treatment, anopheline resistance to insecticides and measures to be taken when it appears, survey techniques—

These are disturbing figures since they draw attention to such a wide disparity indicating the need for an increase in the number of physicians in certain areas either by the importation of new doctors by enlarging the capacity and productivity of existing medical schools or by creating new institutions.

A further study however of figures relating the population to physician ratio to that of the population to new physicians (annual graduates) in various continents leads to more encouraging conclusions (see Table I). A comparison of the population to physician ratio in North and Central America with that of Africa indicates a preponderance of 10:1 (902 as opposed to 9055) yet this disparity is considerably lessened when the ratios of population to new physicians in the two continents are compared the American preponderance being in this case a little more than 7:1 (26 000 as opposed to 194 000). In other words the proportion of new physicians linked with the birth rate indicates a substantial increase in the number of medical practitioners in Africa over the next few decades.

The Directory records *inter alia* the names and addresses of schools, their year of foundation, their ownership and the number of physicians in the countries concerned. It can be seen from a study of the years in which schools were founded (see table below) that the extension of medical education over the centuries gradual at first accelerated considerably from the beginning of the nineteenth century onwards, the last decade alone saw the foundation of more than 100 medical schools.<sup>3</sup>

Reference is made in the Directory to the system of medical education that prevails in each country although it must be pointed out that the term system in this context denotes the characteristic methods of preparing medical practitioners rather than specific medical doctrines. As was to be expected the information supplied was

detailed in the case of some institutions incomplete for others. Certain difficulties arise in the comparative study of medical education due to the variations in the length of courses which range from four years in some countries to eight years in others. An understanding of the terminology of the various courses will to a certain extent help in dispelling these difficulties.

### Dates of foundation of medical schools

Date	Number
for date	of medical schools
Before 1300	10
1300-1399	9
1400-1499	17
1500-1599	13
1600-1699	12
1700-1799	27
1800-1849	82
1850-1899	107
1900-1919	79
1920-1939	86
1940-1945	49
1946-1957	108
Total	589

It be en th t th t tal number of m d c l schools  
 i s d sh s table d fr rs m t n lly from th l g en in Tabl 1  
 Th s d scrp y is e pla abl by th f et that th d of  
 f u d i n was t g h se Al for ano reasons  
 tra t t t h a e s p e d th f operations and the  
 t bl deals only w th those wh h e still f ct e

The term pre medical is used in some countries to denote the period preliminary to the actual study of medicine during which the student is engaged in such subjects as chemistry physics biology mathematics languages and general culture. This syllabus will be completed either during the secondary school course after graduation from secondary school or during the years spent at a faculty or school of medicine. The full medical course will however include the time spent in the two last mentioned establishments. The "pre clinical" and clinical periods constitute the medical course proper and in some countries there is no differentiation between these two terms. "Internship" has a variety of meanings in different countries denoting either (a) a period

An l y s of th d ta n th tabl co l d d te the el t  
 sh p betwe g with th n mbe of f d i d ocl i  
 nom dev lo pm t d i g a sel ted period l th  
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## TREATMENT AND CARE OF DRUG ADDICTS

The report has recently been published of the session of the Study Group on Treatment and Care of Drug Addicts held in Geneva from 19 to 24 November 1956<sup>1</sup> to examine the scientific knowledge and clinical experience on this matter and to determine principles which might be applied to the management of addicts with different etiology and pathology and in various cultural surroundings. For the purposes of the session an addict was taken to be a person who habitually and compulsively uses any narcotic drug so as directly to endanger his own or others' health, safety or welfare and the particular drugs considered were opium, opium alkaloids and substances derived therefrom, synthetic substances with morphine-like characteristics and cannabis substances. Where prevention was considered it was confined to the problem of re-addiction (or relapse) of addicts who have undergone or are undergoing treatment.

Fortunately a great number of addicts are relatively easily amenable to treatment. For instance, mass methods of treatment may be highly successful among persons whose addiction stems from more or less accidental stress, such as exhaustion, hunger or poverty; such persons would predominate in countries where the drugs used are fairly easily available and not prohibitively expensive. Good results may also be obtained with some ease in many cases of addiction due largely to social, environmental or cultural factors. Members of groups or gangs where full participation requires drug taking may prove easily amenable to treatment when removed from the influence of the group. Again those who have become addicted through illness may not present too difficult a problem once the illness has passed. The most difficult to treat, though the least numerous, are those who suffer from a basically pathological

character structure including such features as immaturity of character development, a desire to live only in the present, a narcissistic attitude or a destructive or even a self-destructive tendency. Intensive psychotherapy is needed for such persons and it must in each case be based on an analysis of the factors leading to the addiction. As the Study Group sums up the situation: "Viewed according to amenability to treatment, drug addiction appears to have a much less discouraging prognosis than is generally believed when only the last mentioned group is focused into the centre of attention."

The Study Group points out that for effective treatment of addiction there must be effective limitation of the supply of drugs. In this connexion legal provisions are of great importance: some mature patients may be allowed to submit voluntarily to treatment but "most addicts will require some degree of coercion—preferably some kind of civil commitment to medical treatment—to induce them to desist from what is to them often a pleasurable experience." At the same time it is strongly emphasized that the first principle of treatment is that drug addicts should be looked upon as patients—they should be "treated medically and not punitively"—and treatment should be based on a study of the individual personality. The Group agreed that the goal of treatment is to assist the addict "to achieve a feeling of relative well-being and satisfaction and good interpersonal adjustment without drugs" and stressed that while complete withdrawal of the drug of addiction might be deferred in certain circumstances "the maintenance of drug addiction is not treatment."

Withdrawal of narcotics, however, may be gradual or abrupt as best suits each individual case. For addiction to opium, opiates or morphine-like drugs the majority of the Group considered abrupt withdrawal and substitution of rapidly decreasing doses of methadone to be the most effective sim-

<sup>1</sup> *World Health Org. Wkly. Rep.* 1957, 131, 19 pages.  
Price 1/9 \$0.30. S. C. 1—Published in English, French,  
and Spanish.

in particular measurement of transmission—and surveillance processes. A special section deals with problems which may in theory interfere with the success of malaria eradication—namely those arising from the behaviour of the anopheline vectors, those connected with population movements and those related to the living conditions of the people.

Finally, malaria eradication is considered in relation to other public health activities and

from the viewpoint of international co-operation.

Annexes to the report include a form for collection of information on personnel employed in antimalaria campaigns, a guide for the presentation of malaria eradication programmes to governments and international organizations, and a form for data to be included in reporting the results and costs of antimalaria programmes.

## FOOD ADDITIVES

The addition to foods of an ever increasing scale of non nutritive chemicals intended to improve their appearance, taste, consistency or keeping properties—chemicals for which it has been agreed to use the term *food additives*—has faced the public authorities with the responsibility of defining the limits within which such additives can be authorized. An initial conference convened by FAO and WHO in September 1955 carried out exploratory work in this field and suggested that an expert committee concerned with the technical and administrative aspects of the question be convened to formulate general principles on the use of these substances.

According to the report of this Committee<sup>1</sup> the use of a food additive is justified when it serves to maintain the nutritional quality of a food, to enhance its keeping quality or stability with resulting reduction in food wastage, or to make it more attractive to the consumer, or when such use is technically indispensable in food processing. The use of these substances should be prohibited when the aim is to disguise the effects of faulty processing and handling techniques or to deceive the consumer when such sub-

stances decrease the nutritive value of the food, or when the desired effect could equally well be obtained by other and satisfactory practices.

The experts paid particular attention to the problem of protecting the consumer. In this connexion the safety for use of an additive is an all important consideration. Authorization to use any additive should always be based on the considered judgement of qualified scientists that the intake of the additive will be substantially below any level which could be harmful. Furthermore, permitted additives should be subjected to continuing observation for possible deleterious effects under changing conditions of use. Finally, the consumer should be informed of the presence of an additive in a food stuff—for example, by means of a declaration on the packing.

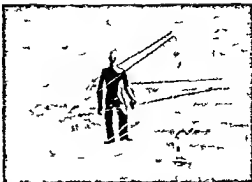
Other questions connected with the use of food additives are also considered in this report, including the restriction of the use of such substances in certain classes of food, limitation on levels of use, the need for specifications of identity, possible combined effects of food additives, the procedure to be followed for the authorization of additives, and a control system. The report also includes a certain number of recommendations to FAO and WHO.

<sup>1</sup> *Wld Hlth Org t hn R p S 1957 129 p ges Pri*  
1/9 50 30 or Sw fr 1—Published in E gl h f b, and  
Spanish.

The film pronounces no judgement. It tries to state facts in a clear and understandable form which will encourage intelligent and objective consideration of alcohol and alcoholism.

**To Your Health** is distributed by the World Health Organization. It will be shown at cinemas and educational centres and on television. It may be obtained in 16 mm or 35 mm size on application to the Division of Public Information, WHO, Palais des Nations, Geneva, or by direct application in the following countries to bodies which have been granted distributing rights:

Americas (Canada, United States, all countries of Latin America)	Center for Mass Communication, Columbia University Press, New York
Australia	The Commonwealth National Library Film Division, Canberra
Finland	The Academic Temperance Union, Helsinki Oy Alkoholite Ab, Helsinki The League of Finnish Temperance Societies, Helsinki
France	Haut Comité d'Etude et d'Information sur l'Alcoolisme, Paris
New Zealand	Commonwealth Film Library, Wellington
Sweden	Centralförbundet för Nykterhetssundervisning (CFN), Stockholm
Switzerland	Secrétariat Antialcoolique Suisse, Lausanne
United Kingdom	Central Office of Information (COI), London



The pictures shown here form part of the sequence dealing with the various motives inducing people to drink. Easily picked out are the desire to be one of the crowd, the popular regard for the man who can hold his liquor, difficulties of everyday life, personal disturbances.

#### Team of medical scientists visits Iran

The World Health Organization sent a "Visiting Team of Medical Scientists to Iran in October 1957. After two weeks with the Medical Faculty of the University of Teheran, the team split into two groups which spent one week each at the Tabriz and Shiraz medical schools. The purpose of the visit was to promote an informal exchange of information and experience between the members of the team and the host faculties both on scientific subjects and on problems of medical education. Only a small amount of formal lecturing or teaching was done. During the past ten years, teams of this kind have visited universities in Austria, Burma, Ceylon, Czechoslovakia, Egypt, Finland, Germany, Greece, India, Indonesia, Iran, Israel, Poland, and elsewhere. Their visits were invariably successful and profitable to visitors and hosts alike.

The team visiting Iran consisted of Dr. L. Kreyberg, Professor of Pathology, University of Oslo; Dr. R. E. Tunbridge, Professor of Medicine, University of Leeds; Dr. P. W. Duchosal, Professor of Cardiology.

plest and easiest technique. On the other hand supportive therapy with such substances as barbiturates or chlorpromazine which mask the symptoms of withdrawal was considered unnecessarily dangerous.

It was also felt advisable to provide a graded series of environmental conditions for treatment ranging from the maximum securi-

ty of locked wards down through open wards to a controlled environment in the home. The determination of the degree of security required in each case should be left to the judgement of the physician.

Background information on the current treatment and care of drug addicts in various countries is annexed to the report.

## Notes and News

### **"To Your Health"** animated cartoon film on alcohol

In 1955 the World Health Organization commissioned Philip Stapp, a well known film artist, to study the reports of the Organization on problems of alcohol with a view to designing a colour cartoon suitable for general public exhibition. Mr Stapp designed and directed the cartoon. The scientific content of the film is based upon the findings of the WHO Expert Committee on Alcohol and Alcoholism and was supervised by Professor E. M. Jellinek, Consultant on Alcoholism for WHO. Animation and production were carried out by Halas and Batchelor, British animated film producers. The film, which was completed in June 1956, is in sound and Technicolor with French, English and German versions. The showing time is ten minutes.



So far the film has been shown primarily to a restricted public of doctors and representatives of governmental or private bodies. It has also been presented at film festivals in Edinburgh, Venice, Cannes, Berlin, Vienna, Padua, Warsaw, Brussels, Cork, and Melbourne. Its very favourable, not to say enthusiastic, reception on these occasions is a testimony to its high documentary and artistic value.

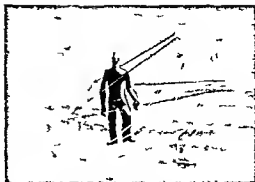
The film illustrates by a series of pictures—captivating in their beauty of line and colour and entertaining, amusing or moving without stooping to the trite—some basic facts about alcohol. It describes the changes in alcohol as it passes through the human body, customs connected with drinking, aspects of contemporary society influencing people to use alcohol, stages in the behaviour of the alcoholic as seen from the medical standpoint, and treatment for alcoholism.



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## PUBLIC HEALTH ENGINEER ASSIGNED TO BURMA

A public health engineer has been assigned by WHO to Rangoon, Burma, to assist the Ministry of Health in developing a practical programme of environmental sanitation to advise the Government on programmes of housing and suitable control measures in problems of food and milk distribution and to advise in various aspects of public health engineering.

Mr Louis J. Lovelace of Haiti has been selected by WHO for this assignment. A graduate of the Harvard School of Sanitary Engineering, Mr Lovelace has had long experience in public health engineering in his own country.

## ENVIRONMENTAL SANITATION PROGRAMME IN TUNISIA

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Mr Mondello has been associated with the Quebec Ministry of Health as a sanitary engineer for 15 years and is a professor in the School of Hygiene at the University of Montreal.

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Prominent among public health problems are those caused by the rapid migration of population from rural to urban areas, particularly in underdeveloped countries. These problems are closely related to the broad subject of industrialization and productivity and for a number of years have been the concern of the United Nations and certain of its specialized agencies including FAO, ILO, UNESCO and WHO.

WHO has accordingly appointed Dr F. A. Donnelly of Northern Rhodesia to study health problems arising from urbanization in a number of representative cities for a period of three months starting 2 September 1957.

Dr Donnelly is the Medical Officer of Health, Lusaka, Northern Rhodesia. He was previously Medical Officer of Health in the cities of Pretoria and Springs and Deputy Medical Officer of Health in Johannesburg, where the movement of persons from rural to urban areas has long been an important public health problem.

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The newest member of the WHO Nursing Education Team at Alexandria is Miss Willa J. Routledge, a graduate of Saskatoon City Hospital School of Nursing, Saskatchewan, Canada, who will be more specially concerned with clinical teaching. Miss Routledge was previously assigned by the Colombo Plan to work for two years with the WHO Nursing Education Team in Hyderabad, India. Her experience includes nursing supervision, clinical teaching and public health.

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Following a joint field survey carried out in early 1956 in several Pacific territories by the WHO Regional Office for the Western Pacific and the South Pacific Commission, it was decided that the staff of the South Pacific Commission's headquarters in Noumea, New Caledonia, should include a WHO health education consultant. Mr Alfred L. Scherzer of the USA has been appointed to this post and took up his duties in July. His principal responsibilities include assisting in the planning and conduct of training courses in health education, the planning and establishment of health education services in various territories, the development of health education in schools and of health education materials.

Mr Scherzer has already served as WHO health education adviser with the Ministry of Health in Ceylon. A former member of the teaching staff of the School of Public Health, Columbia University, Mr Scherzer has also served as US International Cooperation Administration health education adviser to the Directorate of Health Services in Burma.

#### HEALTH SURVEY OF LA RÉUNION

A team of WHO public health staff is at present assisting the governing authorities of the island of La Réunion—a Department of France situated in the Indian Ocean east of Madagascar—in making a general health survey of the island. The purpose of the survey is to provide the basis for an effective programme to improve the health of the island's 260,000 inhabitants. The latest addition to the WHO team is a public health engineer in the person of Mr Tomáš Navrátil, of Bohemia, who took up his duties at the beginning of October. Mr Navrátil has had extensive experience of health engineering in Bohemia.

#### GENETICIST TO ADVISE INDIAN MALARIA INSTITUTE ON INSECT RESISTANCE

For several years the Malaria Institute of India has been conducting experiments on the induction of loss of resistance to DDT and BHC by the *Culex fatigans* species of mosquito. At the request of the WHO Regional Office for South East Asia, Dr Hennes Laun of Germany, a specialist on *C. fatigans*, will go to Delhi in November to discuss the Institute on the genetics of resistance to insecticides in this species. Dr Laun is at present attached to the Max Planck Institute in Tübingen, and has previously conducted research in Berlin and the United States of America.

#### NEW BOOK ON THE WORK OF WHO IN PREPARATION

Mr Richard Caldecott recently presented a manuscript at WHO Headquarters preparing a book on the work of WHO to be published in connection with its fortieth anniversary. This account for the general public will highlight by text and illustrations the events and problems which have given WHO its present character.

Mr Caldecott is well acquainted with the work of the Organization since its foundation. At the invitation of WHO he undertook an information mission to South-East Asia in 1952; this was followed by a number of the activities of FAO, UNESCO, ILO and UNICEF. The mission resulted in his book *Life*

*Against the Jungle* and in the UN/BBC radio series *Me Against Disease*, *Me Against Hunger* and *Men Against Ignorance*. Mr Caldecott is also the author of *The Lamp is Lit: The Story of the World Health Organization*.

#### WHO HEADQUARTERS APPOINTMENT

Dr Wiktoria Winnicka, of Poland, has been appointed Chief of the Maternal and Child Health Section at WHO Headquarters. A graduate of Lwów University, Dr Winnicka was liaison officer for child care between the Polish Government, UNRRA and the United Nations and pursued further studies in this field in the United States of America under an UNRRA fellowship. Dr Winnicka was Chief of the Observation Clinic of the Institute of Maternal and Child Health in Warsaw and succeeds Dr Jessie Birman, who has resumed her post as Professor of Maternal and Child Health at the School of Public Health, Berkeley, California.

#### NEW NURSING OFFICER FOR SOUTH-EAST ASIA REGION

Miss Frances E. Lillywhite has been appointed Nursing Officer in the WHO Regional Office for South East Asia, New Delhi. Her duties will include participation in the planning of the WHO nursing programme in the region, advising national health administrations in regard to nursing and midwifery training and service programmes, the selection of nursing and midwifery personnel for WHO-assisted programmes and advising on the selection of candidates for nursing fellowships and on their study assignments.

Miss Lillywhite has for the past few years been Superintendent Health Visitor with the Buckinghamshire County Council with responsibility for the planning and administration of the county's public health nursing and health education services. She has had wide experience in public health nursing and midwifery including nursing supervision and administration.

#### WHO NURSE EDUCATOR FOR IRAN

The WHO Nursing Education Team at present working in Iran has recently been reinforced by the arrival of Miss Norrie E. Yamanaka, of Canada.

The team is engaged in teaching student nurses at the School of Nursing located at Rey and Miss Yamanaka will be taking part in this work and will

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*World Directory of Medical Schools* 2nd edition revised and enlarged World Health Organization Geneva 314 pages Price £1 5s \$5 00 Sw fr 15—

For an article on this publication and the conclusions which may be drawn from the facts and figures it contains see page 317

*Bulletin of the World Health Organization* 1957 Volume 16 Number 3 (pages 481 706)

An extensive article on this number of the *Bulletin* which deals with onchocerciasis and filariasis will be published in a forthcoming issue of the *Chronicle*. The table of contents is as follows

- Introduction
- Factors in the pathogenesis of onchocerciasis—R A K
- New observations on ocular onchocerciasis: related pathological methods and the pathogenesis of the various eye lesions—F C R de
- Bionomics of the vectors of onchocerciasis in the Ethiopian geographical region—B tha d M ilo
- Simulid vectors of onchocerciasis in Guatemala—J Rom o d León
- Observations on the hemotherapy of onchocerciasis in Bahr el Ghazal Province Sudan—M H S tr & R K k
- DDT tolerance factors for eradication of Simulidae—J P M M hon
- Epidemiology of filariasis in India—A G S R eha va
- The distribution of bancroftian filariasis in Assam—F Ho kung
- Filariasis in the Sudan—R K k
- Outbreak of filariasis (*Wuchereria malayi*) among French and North African servicemen in North Vietnam—H G Ha d
- Bionomics and control of *Culex pipiens fatigans* Wed. Cyl n—C Y Ch & E S The asagavan
- An effective programme for the control of filariasis in Tahiti—J h F K l

**Notes**

- The pathogenicity of *O. loati* in relation to lymphadenopathy and elephantiasis—Donald L A gu r n
- The problem of the *Simulium* a. compl. v.—Po l Freema
- Simulidae and their relation to onchocerciasis in the Sudan—D J Le

- Les simulés et l'onchocercose en Somalie—S l at r Z ett
- Notes and observations on onchocerciasis in Guatemala—Fran co Dia.
- Resistance of *O. choecica* of *Simulium* to dithylos barnazone—L Iarga & J To a
- Evaluation of new onchocercicidal drugs used in Guatemala—J Rom o d León
- Notes on the taxonomy and bionomics of certain filariasis vectors—P F Matt gly
- A note on the survival of the microfilariae of *Manila* o. lardi—Luis Ma. att & Eul o Palomo
- Observations on filariasis in Sarawak and Brunei—J I n d Z lu ta

*Bulletin of the World Health Organization* 1957 Volume 16 Number 4 (pages 707 890)

In an article on sanitary engineering and water economy in Europe W F J M Krul deals with the main problems arising from increasing consumption of water balance between available resources and water needs accumulation of reserves in periods of high flow establishment of a balanced system of purification and prevention of pollution and co-operation between interested bodies at various levels. Water economy should be co-ordinated for the whole of a river basin at the provincial or State level and in some cases even at international level. In this connexion the author examines the regulation of the waters of the Rhine and some of the problems involved.

Pollution and purification *en route* in sandy soils with particular reference to the Netherlands is discussed by J K Baars who has examined the consequences of severe pollution of the surface layers with matter concentrated in a small volume of water and of moderate pollution of the surface layers with matter contained in large quantities of water. The artificial recharge of ground water by infiltration through sand dunes is a method in increasing use and the author refers to the system of intermittent infiltration used by the town of Leyden. The self-purifying capacities of sandy soil due to mineralization of organic matter and adsorption of bacteria and the production

also assist in refresher courses for trained nursing staff aimed at improving nursing service so that it may provide a better basis for student clinical teaching experience. The final objective of the whole programme will be attained when the Iranian staff has acquired the knowledge and experience needed to take over the teaching programme.

Miss Yamanaka has already served in a similar capacity with the Nursing Education team in Hyderabad India to which she was assigned by the Colombo Plan. Prior to taking up international work she had experience as a nursing supervisor, head nurse and nursing instructor in schools of nursing in Canada.

#### HEALTH STATISTICS WORK IN THAILAND

Reliable health statistics by keeping health authorities informed on the amount of morbidity and

mortality caused by various diseases can enable preventive action to be concentrated where it is most effective. This holds good for both national and international health work and the fact that adequate statistics are not as yet available for the areas of the world where the health needs are greatest largely explains why the Organization lays special emphasis on the improvement of health statistics.

WHO's efforts are directed primarily to the improvement of national health statistics services and one of its latest projects of this kind is being carried out in Thailand where Mr Henry H Hamtoft of Denmark recently arrived to start a two-year assignment on behalf of WHO.

Mr Hamtoft will be working in close collaboration with the Director of the country's Division of Vital Statistics as Statistician and Adviser. He comes to the Organization from the National Health Service of Denmark where he has been especially associated with the National Health Morbidity Survey.

## Review of WHO Publications

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*International Sanitary Regulations* World Health Organization Geneva 1957 129 pages index Price 5/- \$1.00 Sw fr 3.—

The annotated edition of the *International Sanitary Regulations* which has just been published by the World Health Organization is designed primarily to meet the practical requirements of port and airport health officers and others concerned with the application of the Regulations.

The *International Sanitary Regulations* were drawn up to revise and consolidate the provisions of the various *International Sanitary Conventions* and similar arrangements. Their aim is to ensure the greatest possible protection against six of the most dangerous epidemic diseases (yellow fever, cholera, plague, smallpox, typhus and relapsing fever) with the minimum of interference with international traffic. Under the Constitution of the World Health Organization, States Members of WHO automatically become parties to the Regulations or to any revision of them unless they make specific rejection or reservation within a stipulated time.

Since their adoption by the World Health Assembly in 1951 the Regulations have been three times amended—in respect of the yellow fever provisions, the form of the International Certificate of Vaccination against Smallpox and the special provisions concerning the sanitary control of pilgrim traffic (these last which were of a transitional nature being deleted). On 1 July 1957 some 160 States and territories were bound by the Regulations, the majority having accepted them without reservations.

In this volume the various articles of the Regulations are annotated to show States and territories that have submitted reservations, the text of the reservations being reproduced in an annex. Another useful feature is the inclusion in footnotes under the articles to which they refer of the various observations and interpretations made by the WHO Committee on International Quarantine in its annual review of the functioning of the Regulations.

The volume contains among other annexes a table showing the position of individual States and territories with respect to the Regulations.

The second paper in this issue is concerned with relapsing fever in Jordan. In the official statistics for the years up to 1953 the vector of relapsing fever incriminated in that country was the louse but in 1954 B Babudieri conducted an investigation which has shown the disease there to be spread very largely by the tick *Ornithodoros tholozani*. This has naturally altered the whole aspect of the problem of control for which certain procedures are suggested. Indeed control of the vector ticks—a matter of considerable importance in its own right—assumes added importance in view of the possibility suggested by some authorities that the tick borne disease may be able to transform itself into the louse borne form. Should that prove to be so the crowded refugee camps in Jordan and the neighbouring countries where lice abound might be seriously threatened with disease and might themselves constitute a menace for other elements of the population of those countries.

The epidemiology of *Brucella* particularly growth characteristics is a very important segment of the study of brucellosis throughout the world. Epidemiological and clinical studies in brucellosis depend upon isolation of the organism and subsequent study of its characteristics. I F Huddleson presents the results of his study of factors in culture medium and in blood affecting the isolation and growth of *Brucella*. This is a continuation of a series of studies Dr Huddleson has been making on this particular problem.

In 1955 one number of the *Bulletin* (Vol 13 No 3) was devoted to methods of immunization against a number of communicable diseases diphtheria among them. Further consideration is given to that disease by A Tasman and H P Lansberg in the issue under review. In the first part of their article they survey the results achieved with active immunization in various countries concluding that large scale immunization consistently carried out has greatly contributed to the virtual eradication of diphtheria in countries such as Canada Denmark England and France. The authors then deal at length with problems of the pathogenesis and

therapy of the disease and finally put forward their views as to its cause the measures to be taken for its control and the most satisfactory form of treatment.

Trachoma is one of the communicable diseases to which increasing international attention and effort have been devoted since the development of promising modern methods of treatment. The reduction of the incidence of trachoma and its eventual elimination as a public health problem are aims that have long been pursued and recent years have seen definite advances made in both laboratory research and control. WHO aided trachoma control campaigns have given encouraging results in Europe North Africa Taiwan and elsewhere. Seven of the contributions to this issue are concerned with various aspects of trachoma and allied diseases—chemotherapy (G B Bietti) diagnosis (P Thygeson) the role of flies in spreading these diseases (G Ponghus) racial and regional differences in epidemiology (P Guerra) antigenic aspects (G B Bietti B Babudieri & M R Pannarale) and clinical and epidemiological aspects (S Postic and A A Smiscal).

Two other communicable diseases are also dealt with in this issue. A M M Payne presents a note on a matter very much in today's news the controversial subject of vaccination against poliomyelitis with live virus vaccines and R R Wilcox and T Cuthe report on the replies received from 25 maritime countries to a questionnaire sent out by WHO on the management of venereal diseases in ports.

Finally there is a comprehensive bibliography of the literature on leishmaniasis published between 1950 and 1955.

*Bulletin of the World Health Organization*  
1957 Volume 16 Number 6 (pages 1083-1247)

In proposing the adoption of an index of endemicity S Swaroop uses cholera mortality rates by district in India in order to define the terms "endemic" and "endemicity". The index he suggests is an average figure

of free oxygen by algae in storage reservoirs are examined

The pathogenesis of epileptic and hysterical seizures is discussed by E E Krapf who considers that behind the reactions manifested in consciousness and motility there lies a fundamental function of defence and that the nature of the seizures is decided by the level of physiogenic or psychogenic regression prevailing in different cases. He holds that the pathogenesis of epileptic seizures is of a truly psychosomatic nature and that this circumstance should be reflected in the therapeutic approach to these disorders.

Several methods have been advanced for refinement of the conventional infant mortality rate by relating the deaths to the corresponding annual birth cohorts. V Kannisto has tested the accuracy of these refinement methods and discovered that they give unpredictable and relatively unsatisfactory results. They can therefore not be recommended for indiscriminate routine use.

This number also contains a study on the epidemiology of cholera by Dr R Pollitzer; this is the tenth in a series of cholera studies contributed to the *Bulletin* by this author.

Finally notes are included on the following subjects: Effect of DDT selection pressure on the frequency of chromosomal structures in *Anopheles atroparvus* (G D Alessandro, G Frizzi & M Mariani); Controlling flies on dairy cattle and in dairy barns (E F Knippling & W C McDuffie); Toxicity of three organic phosphorus insecticides to houseflies and mosquitos (A B Hadaway & F Barlow); Assessment of susceptibility to insecticides in anopheline mosquitos (Malaria Section WHO).

*Bulletin of the World Health Organization*  
1957 Volume 16 Number 5 (pages 891-1082)

This issue which is devoted to communicable diseases covers such diverse subjects as studies on typhoid vaccines and the role of flies in the spread of seasonal conjunctivitis.

Although typhoid vaccines have now been in use for over 50 years their real protective value for man has never been subjected to a strictly controlled trial. The first field trials of typhoid vaccine carried out in the British Army between 1904 and 1908 are open to criticism on the grounds of imperfect comparability between the vaccinated and unvaccinated groups yet the results they gave have long been regarded as convincing proof of the effectiveness of the vaccine. Experience during the First and Second World Wars gradually made it clear that no realistic estimate could be made of the efficacy of typhoid vaccines nor was it possible to say which method of preparation was the best or whether the protection afforded to man could be related to the results of existing laboratory tests. When after the Second World War the Government of Yugoslavia decided on vaccination as the principal method of typhoid control in that country it appreciated the need for more reliable information on these points and asked the World Health Organization for advice and guidance. The result of consultations was a decision to carry out the first strictly controlled field trial of typhoid vaccine. The first article in this issue of the *Bulletin* is a preliminary report by the Yugoslav Typhoid Commission on that trial which well illustrates the value of international co-operation—in this case between the Yugoslav Government, WHO and the United States Public Health Service. Such co-operation not only ensured the effective conduct of the trial but has made it possible to disseminate the findings of the experiment in many countries faced with the same problem and to plan future work in such a way as to ensure the comparability of the results.

Two types of vaccine were compared in this trial—alcoholized and the older phenolized type. Of the two the phenolized vaccine proved the more effective giving protection in about 70% of the persons vaccinated but the Commission points out that the results do not necessarily mean that the same degree of protection would be obtained with other batches of either vaccine.



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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based on one third of the total number of years showing the lowest annual mortality (or morbidity) rates and refers only to diseases manifested in man. Despite its limitations it provides an objective numerical method of evaluation permitting areas to be categorized as endemic and further classified into degrees of endemiety.

G. Mandahl Barth attempts a classification of all described species of African *Biomphalaria* (snail intermediate hosts of *Schistosoma*). For each recognized species and subspecies he states the distinguishing characters, indicates the geographical distribution and gives a list of synonyms. The article is illustrated by 15 plates.

Recent studies have revealed that trachoma is widespread in Western Australia and the Territory of Papua and New Guinea—regions where the disease had long been considered as rare. In a study on the origins of trachoma in Australasia and the means by which it was introduced, Ida Mann concludes that the disease was not originally endemic in New Guinea but was introduced barely a century ago by European settlers and imported Chinese labour. The theory of importation also holds good for the Australian mainland where the prevalence and severity of the disease are much greater than in Papua New Guinea and the neighbouring islands because the area was settled earlier and the disease is now implanted there.

The author describes trachoma surveys carried out in Australasia and the various clinical stages of trachoma observed.

The use of chemicals to eliminate the snail intermediate host of bilharziasis would be even more effective if more were known about the physical properties—such as dispersion characteristics—and the biological action of molluscicides. J. W. Klock and his co-workers have applied sodium pentachlorophenate at various dosage levels and by different techniques to the breeding places of *Australorbis glabratus* in Puerto Rico. They observe that treatments at low concentration from 3 to 4 weeks apart show promise as an effective ovicidal measure.

The resistance of insects to insecticides is developing so rapidly that attempts at insect control may fail if they continue to be based on empirical methods alone. In the opinion of L. E. Chadwick, who writes on the physiology of insecticide resistance, three to four times the present number of research workers are needed with adequate methods of dosage and identification to explain the facts as they arise. The author gives an account of present knowledge of insecticide action and resistance mechanisms and stresses the need for an expansion of basic studies on the ecology, biology and physiology of insects. So far, insufficient importance has been attached to basic studies whether to find a remedy for resistance or to hold it in check.

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## CORRIGENDUM

Vol 11 No 67

### TENTH WORLD HEALTH ASSEMBLY

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## THE MECCA PILGRIMAGE \*

The final stage in the international sanitary control of the Mecca Pilgrimage was reached in May of last year when during the Ninth World Health Assembly everything specifically dealing with this subject was deleted from the International Sanitary Regulations and their annexes.

Thus after sixty five years of international sanitary control the Mecca Pilgrimage was freed from special health measures on 1 January 1957. Since this historic date the Mecca pilgrims have been subject to the same health regulations as other international travellers.

### Origin and nature of the Pilgrimage

In the year 10 of the Hegira (AD 632) the Prophet Mohammed who lived in Medina, decided to perform his "Farewell Pilgrimage". When he arrived at the Holy Place of Mena he addressed his followers for the last time. "To-day," he said, "I have completed the building of your religious faith. Let Islam be your faith. Since that date the Islamic faith demands that Moslems should perform the Haj or Great Pilgrimage to Mecca, at least once in their lives provided they have the necessary means. It is not enough to visit the Holy Places in the Hedjaz at any time of the year. Merit can be acquired only by participation in the mass demonstration of faith decreed to take place every year on the tenth day of Dhu al Higga, the last month of the Arab year. To fulfil this sacred duty a Moslem will make any sacrifice. Some indeed devote their whole lives to the attainment of this goal.

The majority of pilgrims are from the middle and poorer classes. Some are extremely poor with nothing but faith in their hearts and their staffs in their hands. They walk from their home countries sometimes

for years begging their way to the Hedjaz. Others can afford only the expenses of the outward journey. The destitution of so many pilgrims has led a number of governments to take measures to prevent the departure of any pilgrim unless his return ticket is paid for.

Every year three months before the date prescribed thousands of Moslems from every part of the world converge on Mecca in large numbers. In the early years the majority came by caravan from Asia and Africa across the Arabian deserts. Now the majority come by sea and a very great number travel by air.

The small town of Mecca gradually becomes thronged with pilgrims. On the ninth day of Dhu al Higga "the day of Arafat" about half a million Moslems gather for the consecration of the Pilgrimage at Mount Arafat, a bleak open hill about 12 miles east of Mecca. Here clad only in the symbolic garb of purity, an unstitched white sheet, every pilgrim must spend the first day of the Pilgrimage.

In the evening of the same day they move to Mozdahifa, about four miles from Mount Arafat. Here they camp for the night and the following day they proceed to Mena, about two miles from Mecca, for three or four days of religious ceremonies characterized by the sacrifice of thousands of camels, sheep and other animals.

On the twelfth or thirteenth day of Dhu al Higga the pilgrims return to Mecca, which is once more filled to overflowing.

An important tradition of the Pilgrimage is that every pilgrim must drink the holy water of the Zam Zam well. Moreover many pilgrims take home tins of the water for their friends and relations.

With the return of the pilgrims to Mecca the Pilgrimage ceremonies come to an end and the pilgrims disperse.

\* Prepared by D. W. Omar, WHO Regional Office for the Eastern Mediterranean.

The Zam-Zam is shallow well from which water is drawn by buckets.

## SCHEDULE OF MEETINGS

2 7 December	Study Group on the Preventive Aspects in the Teaching of Physiology
2 20 December	Environmental Sanitation Seminar Zone II Singapore
7 12 December	Meeting on Malaria Eradication Baghdad
9 14 December	Expert Committee on Health Statistics Sub-Committee on Cancer Statistics Geneva
11 13 December	Antimalaria Co-ordination Board Bangkok
13 20 December	Malaria Symposium Bangkok
6 13 January	Standing Committee on Administration and Finance of the Executive Board Geneva
14 January (approximately 2 3 weeks)	Twenty first session of the Executive Board Geneva
24 28 February	Expert Committee on Medical Rehabilitation Geneva

The mention of specific companies or of certain manufacturers products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature which are not mentioned. Proprietary names are distinguished by initial capital letters.

reached by means of emigrants the Senegal and North America Brazil and Paraguay

The 1907 epidemic is a second example. After a respite of seven years cholera reappeared in the Hedjaz in March 1902. Three months later it broke out suddenly at Moucha (a small village in Upper Egypt) spreading rapidly all over the country and causing 47 000 deaths. According to some reports the source of this terrible epidemic was some Zam Zam water poured by a pilgrim into the well at Moucha his home village. From Egypt the epidemic spread to Syria Palestine and Iraq. Two years later it crossed Persia reaching the Caspian Sea Russia and Poland subsequently appearing in Holland Belgium, Germany Austria Italy and France.

It is believed that cholera first appeared at Mecca in 1831. Between that date and 1912 there were twenty three cholera epidemics in the Hedjaz but since then the disease has not been reported from the area.

From the available epidemiological data it appears that the cholera outbreaks occur mainly during the Pilgrimage period reaching a peak on the days when all the pilgrims are gathered together for the ceremonies at Arafat and Mena. As explained above the epidemics may develop at any time of the year. Cholera outbreaks have occurred in winter as well as in summer so that atmospheric conditions are eliminated as a factor in the epidemiology of cholera in the Hedjaz. A study of the records of the cholera epidemics in the Hedjaz shows however that the winter epidemics are longer and more frequent than the summer epidemics. Finally cholera arrives in the Hedjaz nearly always by sea and from the south though in exceptional cases it may come by the land routes. In 1846 and 1877 it was introduced by land from the north (Iraq) and in 1859 1890 1891 1893 and 1907 by small caravans from the south (Yemen and Asir).

Prior to 1866 pilgrims travelling to the Hedjaz by sea used sailing vessels. The voyage was long and the pilgrims few in number. A new factor came into play in 1866 when steam navigation was used for the first time to carry pilgrims from India

and Egypt to the Hedjaz. This means of transport replaced to a large extent the land caravans which had served as veritable "mobile quarantine stations" since their slowness gave epidemics time to die out in the desert before they could be carried back to the pilgrims' home countries.

The development of steam navigation and the opening of the Suez Canal by shortening the journey to Mecca both from the east and the west favoured the spread of epidemics in both directions.

Thus in the latter half of the nineteenth century Mecca became a "springboard" for the spread of cholera from India to the rest of the world and the problems of international sanitary control raised by the Pilgrimage could no longer be ignored.

### Early attempts at international control

In 1851 the first international conference to discuss a programme for the protection of Europe against diseases imported from the East was held in Paris. Many similar conferences followed but for a number of years no formal agreement on the subject was reached.

Nevertheless without being bound by any signed international convention some of the countries concerned applied certain of the recommendations made at these conferences with regard to the Mecca Pilgrimage.

Thus the first sanitary measures for the control of Pilgrimages were applied by Egypt in 1858. Ships carrying returning pilgrims and having on board cases or suspected cases of cholera had to be put under quarantine for ten days. The period of quarantine was reduced to five days for ships without any cases aboard.

In 1859 it was recommended that a medical officer should be appointed to every pilgrim ship while in 1864 the number of pilgrims the vessels were authorized to carry was fixed according to their tonnage.

The cholera pandemic spread by the 1865 Pilgrimage caused 60 000 deaths in Egypt alone over a three month period swept rapidly through Europe and even travelled as far as New York. This alarming situation

## Sanitary problems of the Mecca Pilgrimage in the past

The conditions under which the Pilgrimage to Mecca was performed in the past particularly by the poorer pilgrims were so rigorous as to be a severe strain on even the strongest. A large number of the pilgrims were old and infirm some of them made the Pilgrimage with the sole object of dying in the Holy Land. It was found by experience that while deaths among pilgrims on the outward journey were comparatively rare mortality after the Pilgrimage ceremonies and on the journey home was sometimes very high even in the absence of epidemics. For this reason a number of countries now subject pilgrims to a medical examination before allowing them to proceed to the Hedjaz.

The lunar Arabic year is eleven days shorter than the Gregorian year so that although the Pilgrimage takes place at a fixed date on the Arabic calendar it falls somewhat earlier each succeeding year. This means that pilgrims are subjected to climatic conditions ranging according to the date of the Pilgrimage from the merciless winds of a desert winter to the fiercest heat of summer. It is therefore not surprising that pilgrims may be affected by sunstroke.

In the past appalling overcrowding and primitive environmental sanitation facilities coupled with severe climatic conditions made the Pilgrimage an ideal breeding ground of infection.

## The Mecca Pilgrimage and past pandemics

The majority of Mecca pilgrims come from countries where such pestilential diseases as cholera, plague and smallpox are endemic and their presence in large numbers in the holy towns of Islam at one time made the Hedjaz a danger spot from which epidemics of these diseases were liable to spread all over the world.

Malaria, dysentery and other water borne epidemic diseases were always common among returning pilgrims as was smallpox until vaccination of pilgrims was made

compulsory by most of the countries concerned.

In 1896 the Pilgrimage was for the first time affected by a plague pandemic and the disease reappeared in Jeddah in the following year. The infection was thought to have been introduced by pilgrims from Sana (Yemen) where plague was prevalent. Between 1897 and 1918 there were nine outbreaks of plague at the Pilgrimage but none has been reported from the Hedjaz since then.

Although plague has been treated in all the International Sanitary Conventions on the same footing as cholera it has never been of the same epidemiological importance during the Pilgrimage. Outbreaks of plague at the Pilgrimage have mainly been confined to the inhabitants of the Hedjaz and there have been few victims among the pilgrims themselves. The anti-rat and quarantine measures now taken in ships may be considered as a sure safeguard against the spread of plague.

## Cholera the worst enemy of the Pilgrimage

Of all the diseases which have attacked or threatened the Pilgrimage none has been so serious and so disastrous as cholera. It was the spread of cholera as a result of the Mecca Pilgrimage to Europe and to the rest of the world which first led to international agreements putting the Pilgrimage under special sanitary control. With pilgrims coming from areas in which the disease is endemic and subjected to conditions of living which could set off an infection or favour its spread it is not surprising that cholera has been the worst enemy of the Pilgrimage.

One notable cholera pandemic spread by the Pilgrimage originated in India in 1863. The disease broke out in Mecca two years later during the Jubilee Pilgrimage of 1865 in which a particularly large number of pilgrims took part. After the Pilgrimage the infection was carried by African pilgrims to their own countries appearing in Egypt and in all the Mediterranean ports whence it



prompted the Constantinople International Sanitary Conference of 1866 at which a certain number of sanitary control measures were recommended including the medical examination of pilgrims leaving the Hedjaz by sea and the prohibition of travel home by the sea route in the event of a cholera outbreak at Mecca

### The first International Sanitary Conventions

It was not however until the International Sanitary Conference at Venice in 1892 that the First International Sanitary Convention was signed and ratified and the sanitary control of the Mecca Pilgrimage became the subject of an international agreement

A comprehensive study of the problem was made and a certain number of measures were prescribed. It was agreed that each pilgrim ship should be provided with a disinfection stove and carry a qualified doctor on board

Quarantine control was imposed on all ships returning north after the Pilgrimage. Ships coming from the Arab coast of the Red Sea and carrying pilgrims had to call at El Tor Quarantine Station in the Gulf of Suez where the pilgrims were put under observation for a period of 15 days if the ship carried an unclean bill of health for cholera and for a period of three to four days if the ship carried a clean bill of health

The El Tor Quarantine Station had already demonstrated its effectiveness by preventing the spread of cholera from Mecca to the west in 1890 and 1891 and was to do so again on a number of occasions when thanks to its vigilance cholera epidemics reported in the Hedjaz failed to reach Egypt

One of the main subjects discussed during the Venice Conference of 1892 was the reorganization of the Sanitary Maritime and Quarantine Board of Egypt under whose auspices the first quarantine stations for pilgrims had been established

Further measures relating to the Mecca Pilgrimage were added at a conference in Paris in 1894. It was prescribed that pilgrims could not proceed to the Hedjaz unless they

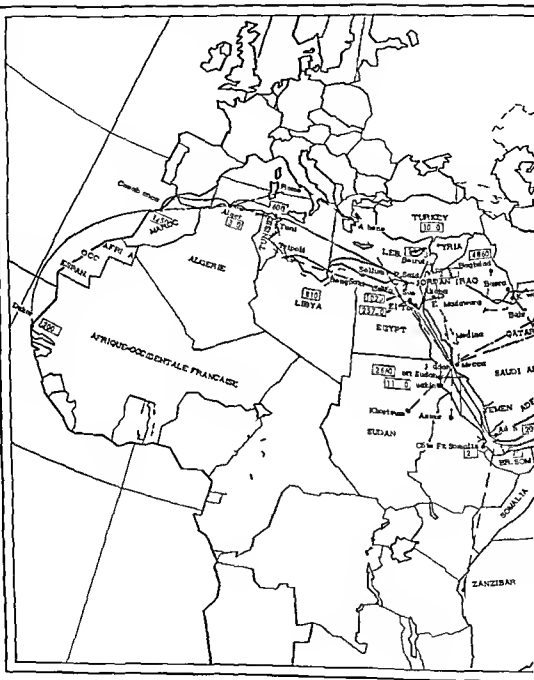
had deposited a sum of money to cover the expenses of their voyage and the maintenance of their families during their absence that they should undergo a medical examination at their home ports of departure and be disinfected before embarkation and that they should be put under observation for a period of five days before embarkation if the port of departure was infected with cholera

The 1894 Convention also included a detailed description of the sanitary equipment of a pilgrim ship as well as measures for the sanitary control of these ships before and during the voyage. All pilgrim ships coming from the south were required to put in at Kamaran Sanitary Station where the pilgrims were submitted to quarantine control before proceeding to the Hedjaz. Medical examination and disinfection of returning pilgrims at the Hedjaz ports of departure were also prescribed

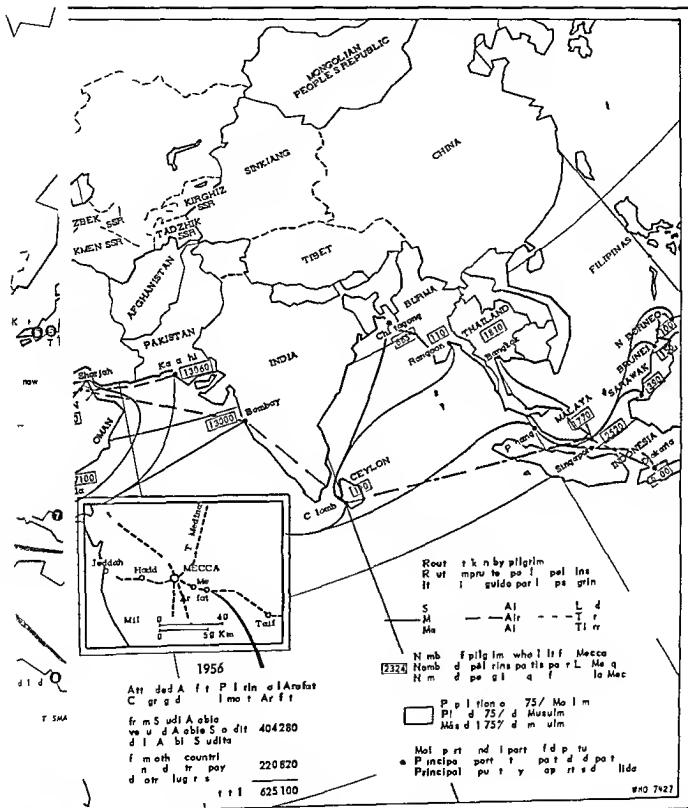
In a new Convention signed at Venice in 1897 measures similar to those against cholera were included for plague. Conferences at Paris in 1903 and 1912 consolidated the provisions of the earlier conventions concerning the Mecca Pilgrimage

### The 1926 International Sanitary Convention

The activities of the Office International d'Hygiène Publique (OIHP) established by an agreement signed at Rome in 1907 and the work of the Health Organization of the League of Nations established in 1921 paved the way for the adoption of the 1926 International Sanitary Convention. This Convention Part 3 of which is devoted to special provisions regarding the Pilgrimage and to specific regulations setting forth the sanitary control measures for all ships carrying pilgrims served as a charter for the guidance of quarantine services for more than twenty five years. It covers in detail the measures to be taken prior to the embarkation of the pilgrims sanitary and medical facilities aboard the pilgrim ships and quarantine regulations for outward and homeward voyages by various sea routes as well as for caravans and trains







## NEW DEVELOPMENTS IN THE PROTECTION OF CHILDREN BY MEANS OF VACCINATION

WHO has been concerned since its inception with the vaccination of children against smallpox diphtheria tetanus and whooping cough as well as the vaccination of both adults and children against typhoid and paratyphoid fevers. The value of such vaccination is no longer disputed for example it is thanks to large scale vaccination that we may now hope to see diphtheria vanish. This disease has ceased to be an alarming problem in many countries where vaccination has been systematically carried out for several years. The same can be said of smallpox in most countries in the temperate zone. Nevertheless smallpox is still endemic in certain tropical regions from which it is sometimes accidentally introduced into healthy regions causing more or less serious epidemic outbreaks. The WHO Committee on International Quarantine reported quite recently that in 1957 smallpox epidemics occurred in eight countries (Ceylon Ghana Iran Italy Lebanon Sierra Leone Sudan and the United Kingdom) and were definitely proved to have been caused by travellers coming from infected countries. Isolated imported cases were notified in ten other countries. Thus vigilance remains essential and vaccination measures must be maintained and even strengthened if necessary.

One of the major difficulties of smallpox vaccination in countries with a tropical climate was until recent years the impossibility of storing the glycerinated vaccine lymph at a low enough temperature to maintain its potency. The development of effective dried vaccines which resist the temperatures encountered in the tropics seems a promising solution to this problem of smallpox control and will be discussed later.

Systematic vaccination against typhoid and paratyphoid fevers remained virtually empirical for half a century in the absence of

laboratory methods and controlled field trials for scientific evaluation of the results. However in 1953 a decisive step was taken when the Yugoslav Government undertook a strictly controlled pilot field trial based on similar antipertussis studies in Great Britain. The results of this trial which lasted for two years are of considerable interest and will encourage other countries to take similar measures.

The preparation of vaccines against pertussis has involved work extending over many years. Variations in the effectiveness of the vaccines and the impossibility of using laboratory tests to evaluate their potency made the general application of such vaccines difficult. These drawbacks have been practically overcome and the recent establishment of an International Standard for Pertussis Vaccine clearly shows that reliable criteria for the evaluation of this vaccine are now available.

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General adherence to these Regulations on the part of the responsible authorities has undoubtedly made a considerable contribution to the rapid improvement in standards of health control since the end of the Second World War. At this point it should be mentioned that even before the adoption of the Regulations the World Health Organization had taken over the work of issuing the yearly reports of the Mecca Pilgrimage starting in 1947. Over the years these reports reveal some of the improvements in the health measures adopted for the protection of the pilgrims.

In 1956 the Government of Saudi Arabia invited a group of WHO Experts on quarantine matters to visit the country and to inquire into the provisions made for the health of the pilgrims during the Pilgrimage season.

The Director General of WHO instructed this group to

visit the Quarantine station at Jeddah and such other institutions as exist in Saudi Arabia related to the health of pilgrims and to learn of any arrangements made with the same object

make to the Health Authorities of Saudi Arabia such suggestions—if any—as may ensure the efficient functioning of the quarantine station and the institutions and arrangements related to the health of pilgrims

inform the Saudi Arabian Government of the effectiveness in protecting the health of pilgrims of their installations, equipment and staff either at their present stage of development or after the completion of such improvements as may have been suggested by the group

The report submitted by this group of experts stated that the quarantine arrangements for the pilgrims at Jeddah were adequate and satisfactory from every point of view. At Mecca and Medina the group noted that the development of health facilities

had been fairly rapid although some minor points required further attention. The report concluded with some suggestions for improvements.

The new Quarantine Station at Jeddah which replaced the old station on the island of Khamran was opened in April 1956. It is a well planned modern institution with up to date hospital, laboratory, pharmacy, refrigeration apparatus, laundry, water supply and bathrooms.

The Ninth World Health Assembly considered the report of the group of experts on quarantine on their visit to Jeddah and noted that the Health Administration for Saudi Arabia is now fully equipped to deal with all sanitary problems connected with the Pilgrimage within its territory.

The special measures originating sixty five years ago for the sanitary control of pilgrim traffic approaching or leaving the Hedjaz during the season of the Pilgrimage are thus no longer required and the Ninth World Health Assembly accordingly deleted the relevant provisions of the International Sanitary Regulations and of Annexes A and B. However as it was thought that some governments might wish to maintain certain special requirements for persons taking part in periodic mass congregations especially routine cholera and smallpox vaccinations one article of the Regulations (Article 103) was amended to permit such special treatment.

Similarly in order that the deletion of Annex B of the Regulations which dealt with standards of hygiene on pilgrim ships and on aircraft carrying pilgrims should not result in a deterioration of conditions on board the States concerned agreed to retain the international standards in their national legislation.

Over a period of years the countries from which the pilgrims set out have increased their efforts to ensure that only healthy and properly immunized persons leave for Mecca and now the health authorities of Saudi Arabia have assumed important additional responsibilities for the sanitary control of the Pilgrimage.

## NEW DEVELOPMENTS IN THE PROTECTION OF CHILDREN BY MEANS OF VACCINATION

WHO has been concerned since its inception with the vaccination of children against smallpox diphtheria tetanus and whooping cough as well as the vaccination of both adults and children against typhoid and paratyphoid fevers. The value of such vaccination is no longer disputed for example it is thanks to large scale vaccination that we may now hope to see diphtheria vanish. This disease has ceased to be an alarming problem in many countries where vaccination has been systematically carried out for several years. The same can be said of smallpox in most countries in the temperate zone. Nevertheless smallpox is still endemic in certain tropical regions from which it is sometimes accidentally introduced into healthy regions causing more or less serious epidemic outbreaks. The WHO Committee on International Quarantine reported quite recently that in 1957 smallpox epidemics occurred in eight countries (Ceylon Ghana Iran Italy Lebanon Sierra Leone Sudan and the United Kingdom) and were definitely proved to have been caused by travellers coming from infected countries. Isolated imported cases were notified in ten other countries. Thus vigilance remains essential and vaccination measures must be maintained and even strengthened if necessary.

One of the major difficulties of smallpox vaccination in countries with a tropical climate was until recent years the impossibility of storing the glycerinated vaccine lymph at a low enough temperature to maintain its potency. The development of effective dried vaccines which resist the temperatures encountered in the tropics seems a promising solution to this problem of smallpox control and will be discussed later.

Systematic vaccination against typhoid and paratyphoid fevers remained virtually empirical for half a century in the absence of

laboratory methods and controlled field trials for scientific evaluation of the results. However in 1953 a decisive step was taken when the Yugoslav Government undertook a strictly controlled pilot field trial based on similar antipertussis studies in Great Britain. The results of this trial which lasted for two years are of considerable interest and will encourage other countries to take similar measures.

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General adherence to these Regulations on the part of the responsible authorities has undoubtedly made a contribution to the rapid improvement of health control since the Second World War. At this point it is mentioned that even before the promulgation of the Regulations the Saudi Government had taken over the compilation of the yearly reports of the health authorities starting in 1947. Over the years these reports reveal some of the improvements and measures adopted for the protection of pilgrims.

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From 1952 onwards WHO gave financial assistance and helped to organize the research work which led to the development of a dried smallpox vaccine. The Yugoslav typhoid vaccination project was successfully completed with the technical and financial support of WHO. The research on pertussis vaccine the results of which were recently published was also assisted by a financial grant from WHO.

Several International Reference Preparations and International Standards have been established for vaccines and diagnostic tests (plain and adsorbed diphtheria toxoids, tetanus toxoid, diphtheria toxin for the Schick test, pertussis vaccine—a smallpox vaccine preparation is under study).

It may also be mentioned in passing that WHO has contributed jointly with UNICEF to numerous vaccination campaigns against the diseases of childhood and has also facilitated vaccine production in various countries.

Improvements in vaccination techniques have aroused wide interest in most parts of the world. This is proved by the resolution of the Ninth World Health Assembly (1956) calling for the submission to the Tenth World Health Assembly of

(1) a report on progress in the evaluation and production of typhoid, smallpox and triple diphtheria, pertussis, tetanus vaccines and

(2) a programme for further development in this field in 1958 and subsequent years.

The report called for in this resolution was submitted to the Tenth World Health Assembly.<sup>1</sup> The following information is taken from this report as well as from the discussions to which it gave rise during the Assembly and except where otherwise indicated from articles appearing in the various WHO publications.

### Typhoid vaccination

Environmental sanitation measures which finally bring about the disappearance of

diseases transmitted by polluted water are costly for a country as a whole and their results are slow to appear. Consequently certain governments have applied vaccination as an interim measure for the control of typhoid and paratyphoid fevers but the actual results obtained had not been clearly evaluated nor was it known what type of vaccine was most effective. The Government of Yugoslavia, aided by WHO and the United States Public Health Service, therefore decided to undertake the first carefully planned and strictly controlled field trial of typhoid vaccine ever to be carried out. The provisional report on this pilot trial has been published in the *Bulletin of the World Health Organization*<sup>2</sup> and summarized in the *Chromicle*<sup>3</sup> so that there is no need to deal with it at length here.

One of the two vaccines employed—heat killed and phenol preserved—gave protection which was particularly apparent in adolescents and children. The other—alcohol killed and alcohol preserved—seems to have given hardly any protection. The potency of these two vaccines was tested in various laboratories but it proved impossible to detect any significant difference between them. Thus at present we cannot correlate the results of laboratory tests and of field trials. The resulting position is rather paradoxical: it is possible to prepare effective vaccines against typhoid fever but we do not know upon what factors success depends: what is the best method of preparation nor what test can be relied upon to select the vaccine giving the best protection to human beings. This problem was examined during the past year and it became apparent that new field trials would be necessary. By reason of the cost of these studies, however, the vaccines which it is proposed to use will first be investigated in the laboratory. It is necessary to make sure that they are stable and that they show sharp enough differences in laboratory tests for a comparison of results obtained in the field with those obtained in the laboratory to be possible, useful and valid. As an initial step

it was decided to prepare two large batches of dried vaccine one acetone dried and the other heat killed and freeze dried. Adequate amounts of these vaccines will be prepared to establish later on if the results of the field trials justify this. An International Reference Preparation for Typhoid Vaccine whose potency will have been tested in man. During the Tenth World Health Assembly the Australian delegate stressed the interest of his country in a dried vaccine. The delegate of the USSR stated that the effectiveness of a repository preparation had been proved by fifteen years observation. This preparation is a combination of several antigens (typhus paratyphoid A paratyphoid B Sonne and Fletner dysenteries cholera and tetanus).

#### Dried smallpox vaccine

Freeze-dried smallpox vaccines retain their potency for months or years even in the tropics. One of the best vaccines examined still gave 100% of successful primary vaccinations after keeping for two years at 45°C. Dried vaccines are already used in many campaigns. A symposium sponsored by the Pan American Sanitary Bureau which acts as the Regional Office of WHO for the Americas revealed that they were made and largely used in South America. It was also mentioned that hundreds of thousands of doses of this vaccine had been prepared using the embryonated egg—a method which can be substituted with advantage for the preparation of vaccine lymph in calves or sheep.

The disadvantage just mentioned as regards typhoid vaccine i.e. the lack of correlation between the results of laboratory tests and of field trials has recently been overcome as regards smallpox vaccine. An objective and accurate evaluation of the potency of a vaccine is now possible by means of laboratory tests as well as the prediction on the basis of the vaccine titre of the percentage of successful vaccinations. It will give

Counting of the pocks produced on the chorio-allantoic membrane by a vaccine when injected into the embryonated hen's egg enables a fairly accurate evaluation of its potency to be made. It has been found that in order to give 100% successful vaccinations by the multiple pressure method the vaccine must contain 10 infective units per 0.1 ml. The establishment of an International Reference Preparation for Smallpox Vaccine is being studied on this basis.

#### Pertussis vaccine and combined vaccines (diphtheria tetanus pertussis)

##### *Pertussis vaccine*

The part played by whooping-cough in infant mortality is often under-estimated by physicians as well as by the general public. Its almost world wide distribution is often not realized.

In the field trials of pertussis vaccination carried out a few years ago under the auspices of the Medical Research Council of Great Britain\* every precaution was taken to ensure the comparability of the results and the protective power of pertussis vaccine was clearly proved. The percentage of clinical attacks (attack rate) fell to less than 10% among vaccinated children exposed to infection in the family whereas 80% to 90% of non vaccinated children contracted the disease. But the vaccines which had given this result differed from one another in protective power (expressed as the number of cases per 1000 child months). The aim of subsequent trials was to select from among routine laboratory tests one which would make it possible to correlate protection in the animal with protection in the child. The investigations carried out in this connection by the Medical Research Council—with WHO assistance—covered nearly 29,000 children followed up for an average of 2 years after vaccination. The five vaccines—out of the fourteen tested—which gave the

Cockburn, W. C. (1957) *B. J. Wld Hlth Org* 16 63.  
An account of his symposium will appear in the next issue of the *Chronicle*.

See in this connection *Chron. Wld Hlth Org* 19 6 10 252.  
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*Br. med. J.* 1957 2, 454.



best results came from a mixture of recently isolated strains which had been sub cultured only a few times before being freeze dried so as to preserve them under the optimum conditions for use as seed in vaccine production. The cultures were grown on Bordet Gengou or a liquid medium and were killed and preserved with merthiolate. Mice were inoculated with these vaccines and the response evaluated in terms of agglutinins on the one hand and percentage protection against intracerebral injection of a challenge dose of *Haemophilus pertussis* on the other. These studies showed that a correlation existed between the protection conferred and the agglutinin titre in both children and mice. However other studies have revealed that the agglutinin response in mice does not always give an exact indication of protection or of agglutinin response in children so that this test cannot be regarded as a reliable guide to the value of all vaccines in children. On the other hand the protection conferred by the vaccine against intracerebral infection of the mouse corresponds closely enough to the protection given the child for it to be regarded as indicative of the latter. Consequently the intracerebral mouse protection test was adopted to define vaccine potency and the International Standard for Pertussis Vaccine was established on this basis in 1956.<sup>10</sup> It will now be possible to replace field trials which are difficult to organize as well as expensive by a laboratory test and this represents a considerable advance.

#### *Polyvalent vaccines (diphtheria tetanus pertussis)*

The use of combined vaccines makes it possible to reduce the number of injections thus avoiding the drawbacks attendant on the frequent vaccination of small children. It also has the advantage of curtailing administrative formalities as well as costs. The polyvalent vaccines have met with a favourable reception and are gradually entering into general use. Speaking on behalf of public health administrations several

delegates at the Tenth World Health Assembly expressed their interest in all advances made in this direction since the problem of so many people competing for the baby's arm in the words of the delegate of Ireland is a serious one. The same delegate joined with others in asking WHO to do everything possible to develop a safe and effective polyvalent (cocktail vaccine). It is known that pertussis vaccine enhances the potency of the plain toxoids (diphtheria and tetanus) when these are combined with it. It acts as an adjuvant at least in the absence of any other substance playing this part but until quite recently the only way of comparing the effectiveness of pertussis vaccines alone with that of combined vaccines was by means of field trials which it had not been possible to organize. However it has been shown recently<sup>11</sup> that the agglutinin titre of the serum of children gives a satisfactory indication of the degree of protection conferred by the vaccine. Thus it is now possible to compare the effectiveness of single vaccines with that of polyvalent vaccines by comparing the agglutinin titres of children inoculated with one or other of these two types. It is possible that such comparisons may be made even simpler by means of a mouse test.

#### *Selection of the most suitable period in the life of the child for vaccination*

The selection of the most favourable moment for administering a combined vaccine to children raises still further problems. It is advisable to carry out vaccination against pertussis during the first six months of life since the disease is most often fatal in very young infants. According to Cockburn<sup>1</sup> it is for each country to decide whether the advantages of inoculating children under six months of age with mixed antigens outweigh the disadvantages. Research is necessary in this connection. A further point calling for examination is the possibility of adding poliomyelitis vaccine to the three usual vaccines.

Bull. m. d. J. 1957 2 454

Cockburn W. C. (1955) *Bull. World Health Org.* 13 409

### *Possible sequelae*

It has often been reported that paralytic symptoms can develop following the mixed vaccination of children already infected with poliomyelitis virus particularly if the vaccine preparations contain an alum element. It was thought that this was a serious factor only during the poliomyelitis season and that all that was necessary to avoid such accidents was to carry out vaccination at some other time. However more recent investigations carried out under the auspices of the Medical Research Council of Great Britain seem to indicate that these paralytic reactions are much more frequent among children aged from 6 months to 2 years than was supposed and that the risk is at its height when the incidence of poliomyelitis is lowest (end of spring—beginning of summer). In the opinion of the WHO Expert Committee on Poliomyelitis children vaccinated against poliomyelitis would not be subject to such accidents. However it is not easy to vaccinate infants with vaccines such as those in current use and this problem is still under study.

### *Future prospects*

The WHO programme for the coming years is briefly summarized in a resolution of the Tenth World Health Assembly requesting the Director General "to continue studies on these [typhoid smallpox and diphtheria tetanus pertussis] and other vaccines as outlined in the report, bearing in mind the desirability of conferring effective protection against the greatest possible number of diseases in the smallest possible number of doses" <sup>12</sup>.

The other diseases against which vaccination has already proved its worth and for which standardization of the vaccines concerned is now under study include rabies poliomyelitis yellow fever influenza and cholera. The Study Group on Recommended Requirements for Biological Substances which met in Geneva from 7 to 12 October 1957 considered in particular the requirements which should be satisfied by biological preparations if they are to be accepted as effective prophylactic or therapeutic agents.

*Off. R. Wld H. A. Org. 79 36*

### *Meat hygiene*

This comprehensive book fills a long felt want. It brings together under one cover description of the best methods of meat handling and control of many different countries. Written by 16 experts from all parts of the world, it deals with the epidemiology of meat borne diseases and morient care and inspection, methods of slaughter post mortem inspection processing and marketing, and the training of personnel, with reviews of meat hygiene practices in Europe and in the tropics.

It is a book places on record recent advances in knowledge for the benefit of responsible authorities public health officials veterinarians and students. As a book of reference it is unrivalled, while its design and layout and its many illustrations some of them in colour, make it an easy book to read.

*Medical Office 1957 97 210*

best results came from a mixture of recently isolated strains which had been subcultured only a few times before being freeze dried so as to preserve them under the optimum conditions for use as seed in vaccine production. The cultures were grown on Bordet Gengou or a liquid medium and were killed and preserved with merthiolate. Mice were inoculated with these vaccines and the response evaluated in terms of agglutinins on the one hand and percentage protection against intracerebral injection of a challenge dose of *Haemophilus pertussis* on the other. These studies showed that a correlation existed between the protection conferred and the agglutinin titre in both children and mice. However other studies have revealed that the agglutinin response in mice does not always give an exact indication of protection or of agglutinin response in children so that this test cannot be regarded as a reliable guide to the value of all vaccines in children. On the other hand the protection conferred by the vaccine against intracerebral infection of the mouse corresponds closely enough to the protection given the child for it to be regarded as indicative of the latter. Consequently the intracerebral mouse protection test was adopted to define vaccine potency and the International Standard for Pertussis Vaccine was established on this basis in 1956<sup>10</sup>. It will now be possible to replace field trials which are difficult to organize as well as expensive by a laboratory test and this represents a considerable advance.

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government zoonoses activities. Its role is to complement them by providing services that the individual countries have not found it possible to develop and to co-ordinate them internationally. The principal functions and services of the Center are education and training, consultation and co-ordination, laboratory services, demonstrations, research and information.

### Education and training

Educational and training activities are probably the most important part of the work of the Center. The shortage of well-trained personnel, whether professional workers or lay assistants, is widely recognized throughout the Americas, although the need is somewhat more acute in some countries than in others. It is obviously impossible to carry out successful diagnostic, field control, eradication, therapeutic or research work without qualified staff. To help provide the personnel required, the Center offers a variety of training courses and opportunities for specialized study.

The training methods make full use of demonstrations and trainee participation. Lectures are supplemented with audio-visual aids; laboratory work is arranged so that each trainee actually performs the specific techniques under study. Field demonstrations make it possible for participants to become thoroughly familiar with methods for applying recognized measures of disease control.

Fellowships for training at the Center are provided by individual governments and by PASB/WHO; they will undoubtedly also be provided by other agencies. Both short-term and long-term training programmes are offered. Special courses, seminars and workshops of from one to twelve weeks' duration are being scheduled for persons already possessing certain professional or technical qualifications. An annual 3 to 4-week course on zoonoses control will be held for recent graduates from Schools of Public Health, including veterinarians and also physicians intending to

take up epidemiological or rural health assignments. Other courses will deal with laboratory procedures relating to brucellosis, including diagnosis and vaccine production; the diagnosis of rabies and control methods for hydatidosis. An annual two-month course will provide non-professional field assistants with training in antizoonoses work. Further courses and seminars will be held as needs and possibilities arise.

Post-graduate courses lasting between six and twelve months are offered for special studies in one or more of the many branches of work on zoonoses. It is anticipated that this type of training will in many cases be developed in co-operation with the universities.

Such co-operation is highly desirable and although its exact pattern remains to be developed, there are excellent opportunities for the Center to work with schools of public health, medicine and veterinary medicine at both the undergraduate and post-graduate levels. One possibility is that students will carry out their field (or thesis) work at the Zoonoses Center after completing their formal university courses.

The educational activities of the Center also include the collection and distribution of audio-visual materials for use in programmes against the zoonoses. Material of this type will, in addition, be produced at the Center on a limited scale when not already available.

### Consultation and co-ordination

The Center provides advice on matters relating to the zoonoses and their control by correspondence or by sending consultants at government request to countries with zoonoses problems. Special attention is being given to the development in each country of the necessary machinery for planning and operating control programmes for the zoonoses. This machinery should be based on united effort and provide for co-ordination and co-operation between public health and animal sanitation agencies with maximum participation by the community.

## THE PAN AMERICAN ZONOSSES CENTER \*

The Pan American Zoonoses Center at Azul Province of Buenos Aires Argentina is an international institution for the promotion and strengthening of activities against the zoonoses in the countries of the Americas. The Center was formally established on 10 August 1956 with the signing of an agreement between the Government of Argentina as host country and the Pan American Sanitary Bureau (Regional Office of the World Health Organization) as the responsible international agency. The work of organizing and installing the Center began later that year.

### Site and facilities

After a careful study of the facilities offered by a number of countries Argentina was selected as host country for the Center. Azul, a city of about 25 000 inhabitants, 185 miles south of the Argentine capital, is situated in an important livestock region. The co-operation of the medical and veterinary professions, livestock owners, hospitals, municipal authorities and other local groups is a great asset to the Center.

The building provided for the Center by the Argentine Government is of two storey construction with adequate space for present needs including laboratories, offices, classrooms and a library. The host government provides the funds for the upkeep and servicing of the building and has agreed to finance new construction as necessary.

The Argentine Government has also purchased a 370 acre farm annex for the exclusive use of the Center. It is less than three miles from the main building and provides accommodation for isolation units, holding pens and the laboratory animal colony.

### Administration

The Center was created to meet a wish expressed by various American Governments

individually or collectively at several international meetings both political and technical.

Its financial and material support is at present derived from three sources: the host government (Argentina), the Pan American Sanitary Bureau and the United Nations Technical Assistance Programme. Negotiations are now in progress to extend financial support for the Center and ensure its operation on a permanent basis.

The permanent technical staff members—physicians, veterinarians and members of allied professions—are international officials; i.e. their posts are financed from international funds. In addition, international or special funds permit the employment of specialists in various aspects of zoonoses work for limited periods. The permanent auxiliary staff—consisting of semi-professional and non-skilled workers—is recruited in Argentina and is paid from funds contributed by the host government.

### Functions and operations

The diseases classified as zoonoses are so many in number that the Center will not be able at least initially to give due attention to all of them. Priorities are being established in accordance with the relative impact of the different zoonotic diseases on human welfare and their geographical extension in the Americas. Thus brucellosis, hydatidosis and rabies are being given the major share of attention, followed by virus encephalitis, anthrax, leptospirosis, tuberculosis, psittacosis, trichinosis and salmonellosis. This does not mean that the remaining diseases are to be completely ignored, since the Center is destined to be a clearing house for information on all the zoonoses. Furthermore, the priorities may be revised from time to time to meet epidemiological, epizootiological changes and recognized needs.

The Pan American Zoonoses Center is not intended to replace nor to compete with

\* Prepared by D. Benjamin D. Blood, P. N. American Zoonoses Centre, Azul, Argentina.

## Notes and News

### Regional Committee for Africa

The Regional Committee for Africa held its seventh session from 16 to 21 September 1957 at Brazzaville (French Equatorial Africa). Representatives of 10 Member and Associate Member States of the African Region attended together with representatives of the United Nations and of several inter governmental and non governmental organizations. Dr B. M. Clark (Union of South Africa) and Dr E. W. A. Bannerman (Ghana) were elected Chairman and Vice Chairman respectively and Drs J. B. Titus (Liberia) and W. I. Barton (United Kingdom) acted as Rapporteurs.

As with the other Regional Committees the main tasks at this regular session of the Regional Committee for Africa were the examination of the activities undertaken during the period 1 July 1956-30 June 1957 by WHO in collaboration with the governments of the Region, the introduction of any necessary modifications into the proposed programme for 1958 and the establishment of a proposed programme and budget for 1959. The Committee was also required to deal with certain questions relating to resolutions adopted by the Tenth World Health Assembly and by the Executive Board at its nineteenth session.

In the period under review two important events occurred in the Region. Ghana became a full Member of WHO and the Regional Office was installed in its new premises at Cite du Djoue near Brazzaville.

Dr F. J. C. Cambournac, Regional Director for Africa, stated that the regional activities had expanded very considerably during the period 1956/57. The main emphasis in the Office's programme has been on rural health projects seeing that most of the African people concerned live in rural surroundings. The aim is to create a vast network of national health services capable of including and directing special services for the solution of specific problems.

Priority has been given to professional education and training programmes. 78 fellowships have been awarded so far and it is hoped to bring this number up to 176 by the end of the year (89% of these fellowships were for study outside the Region). Another of the major tasks is health education of the public and in particular of mothers and children. It was also recently found necessary to organize conferences of a new type for the co-ordination of national campaigns against certain diseases (e.g. malaria and yaws) when such campaigns are being conducted in neighbouring countries. Criteria for the control of yaws and leprosy were established and the Regional Director expressed the belief that within a few years the yaws control programme will be extended to all those zones of the Region in which the disease is present and that in two or three years most lepers (numbering at present between 1½ and 2 million) will be undergoing treatment. Except in certain areas in the south-east of the Region there is no prospect of the eradication of malaria in the near future. The problem is most serious in West Africa where various obstacles have been encountered due for the most part to the special behaviour of the vector. The only solution to the problem and the best means of interrupting the transmission of the disease in these unfavourable circumstances would be to undertake a co-ordinated programme of research throughout the whole of the West African area.

The proposed programme and budget for 1959 was approved by the Committee and it now awaits confirmation by the Eleventh World Health Assembly. The proposals include in addition to fellowships 103 projects for direct assistance to governments and inter-country projects for which an amount of about \$1 321 000 is required from the Organization's regular budget and about \$943 000 from United Nations Technical Assistance. The projects include activities in the fields of nutrition and malnutrition.

Visits by consultants also provide an opportunity for the international co-ordination of control and eradication programmes

### Laboratory services

These services include reference diagnosis and standardization of antigens vaccines sera and other biological products confirmatory testing of such products for potency and safety distribution of strains of viruses and bacteria for production or challenge purposes and of standard antigens vaccines and sera for use in check testing

The Center will keep a model colony of laboratory animals for training demonstration and study purposes as well as for supplying foundation stock to other institutions

### Demonstrations

The Center is using field campaigns against the various zoonoses for training purposes. Trainees actually take part in anti zoonoses programmes on the national as well as the provincial level in Azul and other parts of Argentina. Demonstration work will also include the development of special control programmes for various zoonoses in different parts of the Americas the number type and extent of such programmes being dependent upon the needs capabilities and desires of the country concerned

### Research

Research at the Center is of an applied nature e.g. the evaluation of vaccines under certain field conditions the practical application of diagnostic procedures the assessment of drugs for their anti parasitic effect and similar projects. Surveys and epidemiological epizootiological studies on certain of the zoonoses will also be undertaken. Other research

plans include the collection and processing of statistical data on the occurrence and overall importance of the zoonoses in man and animals

The needs and opportunities for research on the zoonoses are vast and the Center itself can be expected to cover only a very small part of this work. Public and private institutions in all countries must therefore continue and intensify their own zoonoses research work which it will be the responsibility of the Center to stimulate and co-ordinate

### Information

Facilities are being developed to permit the Center to serve as a source of both technical and popular information on the zoonoses. A library service will make microfilms and photocopies of technical references available to investigators and control officials. Priority is being given to the collection and cataloguing of books periodicals bulletins and reports on diseases common to man and animals

The film library will contain as complete a collection as possible of films filmstrips and slides on the zoonoses and their control. New films will be produced when possible on subjects for which no suitable material already exists

A periodic information bulletin is to be published containing abstracts of the world literature on zoonotic diseases as well as brief references to the latest developments in this field as they may occur in the Americas and elsewhere

A collection of bulletins pamphlets illustrated booklets posters exhibits and other items used with success on the public education side of zoonoses control is maintained for demonstration and loan. New material of this type will be prepared at the Center as needs and resources permit





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Dunn's discussion of the report it was pointed out that the integration of curative and preventive services under a single directorate will probably be accelerated as a result of the development of peripheral health services. The representatives agreed that WHO's efforts for the encouragement of training in preventive and social medicine will undoubtedly contribute considerably to such integration.

As for some time to come it will still be necessary for a great part of the work of the health services to be done by semi-qualified staff the assistance which the Organization gives in the field of professional training should be aimed not only at increasing the numbers of personnel but also at progressively raising the level of training until it reaches approved standards.

Several participants drew attention to the fact that although protein insufficiency is a nutritional problem which calls for continuous study there are also a number of marginal nutritional conditions which offer very favourable terrain for serious parasitic infestations.

The problem of filariasis was discussed and it appeared that in one country of the Region while filariasis could at the present time be controlled in rural areas this was not the case in urban districts. It was felt that the experience gained in several countries would provide some very enlightening information and it was suggested that WHO should assemble technical data on the subject.

The view was expressed that in one country of the Region at least WHO should assist in organizing a programme for the treatment of roundworm infestation. The programme to be implemented by auxiliary health workers. With respect to the same country it was stated that WHO could with advantage study the question of the care of old people and of chronic and incurable invalids who occupy more and more beds in the hospitals.

A number of representatives expressed the hope that the Organization and the respective governments would combine their efforts to obtain the help of other institutions and

bodies—in particular for the production of drugs for mass campaigns.

A number of other questions were debated including the training of radiological technicians the training of indigenous midwives the possibilities of increasing the number of dental health programmes and the necessity for co-ordinating malaria eradication programmes both within the Region and as between the Region and neighbouring countries belonging to other WHO Regions.

Four meetings were devoted to technical discussions on the theme "How can health education of the public be more effectively developed in South East Asia?" Speakers dealt with the following aspects: planning organization and budget of health education programmes training of all those who can be useful in the field of health education methods and means of teaching the public analysis of results. In 1958 the theme of the technical discussions will be "Health aspects of community development programmes."

The cost of the 1959 programme was estimated at about \$3 350 000 this comprises a \$1 360 000 allocation from the WHO regular budget and \$1 990 000 from the United Nations Technical Assistance Programme.

The Committee decided to recommend to the WHO Executive Board that the term of office of the present Regional Director—Dr C. Alan—be extended for a period not exceeding five years.

#### Regional Committee for Europe

The Regional Committee for Europe consisting of the representatives of 25 Member States held its seventh session in Copenhagen from 10 to 13 September 1957. The United Nations and 16 international organizations engaged in health work were also represented. At the opening of the session a tribute was paid to the memory of Dr Gerard Montus Assistant Regional Director for Europe from 1951 until his death in April 1957. The Committee elected the following officers: Dr J. Frandsen (Denmark) Chairman Professor G. A. Canaperia (Italy)

diseases bilharziasis and onchocerciasis the provision of tuberculosis survey teams of teams or consultants for the control of malaria leprosy and treponematoses the organization of training courses for nurses midwives and auxiliary health workers the working out of health education and maternal and child health programmes the convening of seminars on brucellosis veterinary medicine and mental health the provision of financial aid to research workers studying the etiology of cancer in Africa and its relation to certain parasitoses

During the technical discussions on The role of rural health centres in the control of endemic diseases in the Africa Region, it was agreed that it is not desirable to establish a hard and fast definition of a typical rural health centre since no one type could be applicable to the whole of Africa. Circumstances and epidemiological conditions vary not only according to geographical location but also from time to time in the same place and it was recognized that any concept of what a health centre and its functions should be must be open to continual revision. However difficult it may be it is advisable to fix personnel needs of whatever category three or four years in advance so that as far as possible teaching programmes may be established accordingly. It was considered that attendance at continuation courses should be made compulsory for personnel attached to rural health centres. Nearly all speakers emphasized the fact that health education of the public is one of the health centre's most important tasks.

The technical discussions next year will centre around the theme of community development and its health aspects. It was decided that the Regional Committee's eighth session would be held in Monrovia (Liberia) and its ninth in Nairobi (Kenya).

#### **Regional Committee for South East Asia**

The tenth session of the WHO Regional Committee for South East Asia was held from 16 to 20 September 1957 in Rangoon Burma. The representatives of nine countries of the Region attended. Dr Sein Ban of

Burma (Chairman) and Dr J Suhanti of Indonesia (Vice Chairman) directed the debates.

Most of the Committee's time was devoted to examination of the annual report on the Regional Office's activities for the period July 1956 July 1957 and of the proposed programme and budget for 1959.

In the report of Dr C Mani Regional Director for South East Asia dealing with the 131 projects which are at present under way and which are mainly concerned with the control of communicable diseases the development of rural health services the strengthening of national health administrations and professional training it is pointed out that although on the whole progress in public health is being made in the Region the activities are nevertheless hampered by the general shortage of qualified staff. For this reason the professional training of field staff and of public health administrators capable of directing public health services continues to be the Office's most important task. Last year in addition to training counterpart teams and organizing a number of seminars and courses the Office assisted in the running of 40 refresher courses in which 700 medical officers nurses sanitary engineers and technicians and other auxiliary health workers participated. Ninety three fellowships were awarded.

In the opinion of the Regional Director the health administrations must be strengthened and provided with better weapons for their tasks at both country and state levels and in particular for engaging in activities in the fields of rural health maternal and child health environmental sanitation and health education of the public. The community development projects which are being either implemented or studied at the present time in various countries of the Region undoubtedly represent a logical and natural method of developing the social services but in view of the very limited resources available in most countries and the fact that these projects require a great deal of re-adjustment of relations between the various ministries progress must inevitably be slow.

sanitation measures of a public health nature (housing industry water supply disposal of sewage radio-active pollution food additives etc.) In addition research and training institutions should assist health administrations in the evaluation of their activities

The Committee decided that the subject of the technical discussions at the eighth session should be "Collaboration between scientific administrative and educational bodies in improving health services"

The Committee confirmed its decision to meet in Monaco in 1958 and gratefully accepted the invitation of the Romanian Government to hold the 1959 session in Bucharest

#### Regional Committee for the Eastern Mediterranean Sub-Committee A

Sub-Committee A of the seventh session of the Regional Committee for the Eastern Mediterranean met from 23 to 26 September 1957 in Alexandria. The representatives of 16 countries were present together with observers from the United Nations several specialized agencies and certain inter governmental and non governmental organizations. Dr Hafez Amin of Egypt was elected as Chairman and Drs Abdel Hamid El Toukhi of Iraq and Bachir El Roum of Saudi Arabia were appointed as Vice Chairmen

In accordance with a wish previously expressed by Sub-Committee A and with the decision adopted by the Ninth World Health Assembly Arabic was used for the first time as a working language

After expressing appreciation of Dr A. T. Shousha's work as Director of the Regional Office for the Eastern Mediterranean and congratulating his successor Dr A. H. Taba the Sub-Committee turned to examination of the annual report on the Office's activities

Dr Taba in presenting the report stated that in 1956/57 the main emphasis had been on control of communicable diseases as in previous years but that nevertheless more attention had been paid to the training of personnel and to assistance to governments in the development and organization of

national health services. Dr Taba expressed the view that this was "natural and salutary" and showed that certain national health administrations had been able themselves to deal with the problem of communicable diseases thus releasing funds for other activities. A supplementary credit of \$307 000 placed at the disposal of the Eastern Mediterranean Region made it possible to implement new health projects including several campaigns for the control of bilharziasis tuberculosis and trachoma

The report was unanimously adopted and a number of representatives took the occasion to stress the importance of the contribution made by UNICEF and of the financial aid given by United Nations Technical Assistance. Appreciation was expressed for the co-operation of the United States International Co-operation Administration in the field of health

The proposed programme and budget for 1959 presented by the Regional Director were approved. In addition to the proposed budget allocation of about \$1 087 000 the Sub-Committee decided to adopt a programme drawn up for the use of \$1 009 000 from United Nations Technical Assistance funds and \$7 245 000 which it is hoped will be made available to the countries of the Region by UNICEF in the form of equipment and supplies

A number of technical recommendations were put forward and the Sub-Committee invited the respective governments to adopt a system of compulsory antismallpox vaccination every three or five years using the new dried antismallpox vaccine which is more stable than liquid vaccine in hot countries

On the subject of leprosy it was agreed to do away with the system of compulsory isolation and to replace it by home treatment. It was recognized that it will be necessary to instruct medical personnel and the public on this new method of dealing with the disease and the Regional Office was asked to assist in the organization of a campaign for this purpose and in the training of staff for the application of treatment

First Vice Chairman Professor Grashchenkov (USSR) Second Vice Chairman Mr J de Coninck (Belgium) Rapporteur

After noting with satisfaction that five members—Albania Bulgaria Poland Romania and the USSR—had resumed active participation in the work of WHO the Committee expressed the hope that the Member States which had not yet notified their decision to resume active participation would be able to do so in the near future. The total number of active Member States in the European region is at present 27.

Dr Paul J J van de Calseyde Regional Director for Europe presented his report which describes some 130 projects implemented during the year 1956 to 1957 including mass campaigns against communicable eye diseases in several Mediterranean countries training courses in various fields (protection against radiation anesthesiology virus diseases etc.) the award of several hundred fellowships conferences on health education of the public malaria eradication and air pollution the study of the effects on the mental health of children of absence of maternal care survey of the problems of alcoholism and many other activities designed to protect and improve the health of the population throughout the European Region. The Committee expressed its satisfaction with the continued progress made during the period under consideration.

The Committee then made certain changes in the 1958 programme and drew up a draft programme for 1959 comprising about 130 projects as well as budget estimates. The latter include an allocation to the European Region of \$1 300 000 from the regular budget of WHO and of \$300 000 under the UN Technical Assistance Programme. UNICEF will contribute supplies to joint projects with WHO which may reach a value of \$1 500 000.

In view of the increasing importance of the cardiovascular diseases cancer and virus diseases such as poliomyelitis infectious hepatitis and meningo encephalitis the Committee decided to reduce the funds earmarked for tuberculosis surveys in 1958 and 1959 and

to use the sums available for extending work in the field of virology and for convening study groups on the cardiovascular diseases and certain public health problems connected with cancer control.

The Regional Office for Europe will continue its training programme for personnel responsible for protection against nuclear radiation. At the suggestion of the representative of Norway the Committee decided to study at its next session public health problems relating to the uses of atomic energy. In this connection it again drew attention to the importance of establishing and implementing projects concerning the peaceful uses of atomic energy in close contact with the responsible public health authorities.

The Committee also invited the governments of Member States where malaria still exists to intensify their efforts to achieve eradication of the disease and again stressed the importance of the prevention of accidents to children.

In another resolution it is pointed out that according to the WHO Constitution one of the functions of the Organization is "to act as the directing and co-ordinating authority on international health work" and the need to develop co-ordination so as to avoid overlapping activities is emphasized.

The technical discussions dealt with the "Integration of preventive social and curative medicine in health services" a question of great interest both to health administrators and to teachers. The participants considered that there was a need for further improvement in the curricula of medical schools and other training institutions so as to familiarize health workers with the psychological physical and social features of health problems. In the opinion of the Committee moreover this aspect should form an integral part not only of the teaching of preventive and social medicine but also of instruction in the basic and clinical sciences. Furthermore it would be desirable for health administrators to have the opportunity of expressing their views on the curricula of medical schools and of playing an active part in the establishment and implementation of collective hygiene and

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Tejada (Guatemala) Professor Henry Un-  
gar (Israel) and Dr P N Wahi (India)

#### Joint FAO WHO Expert Committee on Nutrition

The fifth Joint FAO/WHO Expert Com-  
mittee on Nutrition met at FAO Head  
quarters Rome from 22 to 29 October to  
review progress since the meeting of the  
fourth Joint Committee on Nutrition held  
in Geneva in 1954. Most of the proposals  
made at that meeting had been carried out.  
For example it had been proposed that  
committees or study groups should be con-  
vened to consider requirements for calories,  
requirements for proteins, food additives  
and nutrition and degenerative diseases.  
These groups had met and their reports  
were submitted to the Committee.

The Committee examined a programme  
for the production of protein rich foods for  
children at the post weaning age. It also  
reviewed the whole question of education  
and training which is of vital importance in  
the prevention of nutritional disease.

The three most important items on the  
agenda were perhaps those concerned with  
deficiency diseases for which extensive pre-  
vention programmes are required. Beriberi,  
the first of these diseases, seems to be on the  
increase in the large rice producing areas  
of the South East Asia and Western Pacific  
Regions, owing to the growing use of small  
power driven mills which produce a very  
highly milled rice deficient in thiamine. The  
disease causes chronic disability in adults  
and many deaths among children.

Avitaminosis A, the second of these  
diseases, is common in Asia, where it is a  
major public health problem in some coun-  
tries. It is most frequently found in its acute  
form among children of pre-school age,  
causing many cases of blindness and a  
number of deaths.

The third deficiency disease considered  
by the Committee was anaemia. While the  
disease is due to a number of different causes,  
there is good evidence of its association with  
inadequate nutrition, e.g. its persistence after

malaria eradication in countries where it was  
previously considered to be linked with  
malaria.

The Committee also discussed the establish-  
ment of criteria for the broad assessment of  
the food consumption and state of nutrition  
of population groups and the related  
questions of calcium intake and the con-  
tamination by strontium "fall out" of plants  
and animals used as human foods.

The following experts took part in the  
meeting: Professor W. J. Darby (USA),  
Dr J. Deeny (Ireland), Professor M. J. L.  
Dols (Netherlands), Dr Toshio Oiso (Japan),  
Dr V. N. Patwardhan (India), Professor  
B. S. Platt (United Kingdom), Dr V. Rama-  
lingaswami (India), Dr Hazel K. Suebeling  
(USA), Professor E. F. Terroine (France),  
and Dr Rudolf Wenger (Austria).

#### Training of health personnel in health educa- tion of the public

The importance of training professional  
and auxiliary health workers for the health  
education of individuals, families and the  
general public is widely recognized by na-  
tional health authorities and has been  
repeatedly stressed at WHO regional con-  
ferences, seminars and technical discussions  
during the past ten years. WHO accordingly  
invited an Expert Committee on Training  
of Health Personnel in Health Education of  
the Public to meet in Geneva from 28 October  
to 1 November 1957. The Committee  
consisted of seven members representing  
public health administration, health  
education, medical education, nursing and  
advanced public health nursing.

The topics discussed by the Committee  
included the attitudes, knowledge and skill  
required for effective health education work,  
principles and factors to be considered in  
the training of health personnel for this  
work and teaching methods that have  
proved successful in training of this type.

The following experts served on the Com-  
mittee: Miss O. Baxendale (United Kingdom),  
Dr J. Burton (United Kingdom), Dr V. S.  
Erchov (USSR), Professor L. Morgan (USA).



instruction about leprosy should be included in medical curricula and in post graduate courses in public health. As regards rehabilitation several participants stated that plastic surgery had not given the results anticipated. Once the patient has been cured he must in fact be again accepted by his family and the community and because of this leprosy is a disease which must also be combated in the social field.

Next year the Committee will devote its technical discussions to Malaria control and eradication. The Regional Committee for the Western Pacific will hold its ninth session at Manila and its tenth session in Taipei, Taiwan (China).

#### Expert Committee on the International Pharmacopoeia

At its meeting in Geneva from 2 to 8 October last the WHO Expert Committee on the International Pharmacopoeia continued work on the preparation of proposed specifications for the examination of pharmaceutical preparations taking modern analytical methods into consideration.

The major part of the session was devoted to the examination of comments from governments, national pharmacopoeia commissions, members of the WHO Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations and other specialists consulted on specifications to be included in a Supplement to the International Pharmacopoeia. Among the other subjects discussed were the WHO Centre for Authentic Chemical Substances now operating in Stockholm and the possibility of providing periodic information sheets on new pharmaceutical preparations to national authorities concerned with their examination.

Volume I of the first edition of the International Pharmacopoeia was published by WHO in 1951 in order to meet a long standing need for proposed specifications for widely used pharmaceutical preparations. A second volume was published in 1955 to be followed by a Supplement and a second

edition is in preparation. Both volumes of the first edition of the International Pharmacopoeia have now been published by WHO in English, French and Spanish and editions in German and Japanese are also available.

The following experts attended the session: Professor H. Baggesgaard Rasmussen (Denmark), Dr T. Canbrück (Sweden), Mr T. C. Denston (United Kingdom), Professor H. Fluck (Switzerland), Dr T. Itai (Japan), Mr F. A. Maurina (USA), Dr L. C. Miller (USA) and Dr J. L. Powers (USA).

#### Classification of atherosclerotic lesions

The classification of atherosclerotic lesions varies considerably from country to country. This makes pathological comparisons on the international level extremely difficult and it is therefore urgent to reach agreement on a basis for classification.

A Study Group to discuss the possibility of developing a classification with uniform terminology and establishing acceptable methods of grading atherosclerotic lesions was convened by WHO in Washington, D.C. from 7 to 11 October 1957. The meeting was conducted by the Pan American Sanitary Bureau, the WHO Regional Office for the Americas.

The fifteen experts participating in the meeting also reviewed the geographic pathology of atherosclerosis and discussed a proposal for the establishment of regional centres for atherosclerosis research. Procedures for the classification of experimental degenerative vascular lesions were discussed together with the bearing of these lesions on the classification of atherosclerosis in man.

The following experts attended the meeting: Dr J. de Bruijn (France), Dr Harold F. Dorn (USA), Professor J. B. Duguid (United Kingdom), Professor H. Hamperl (Germany), Professor W. Hartroft (USA), Professor John Higginson (Union of South Africa), Professor J. F. A. McManus (USA), Professor Toru Miyaji (Japan), Professor James C. Paterson (Canada), Professor Carlos Restrepo (Colombia), Dr J. P. Strong (USA), Professor A. I. Strukov (USSR), Dr Carlos

antimalaria programmes in the three neighbouring territories by enabling administrators and technical personnel to meet for exchanges of information and the discussion of common problems both administrative and technical

### Radioisotopes in scientific research

The use of radioisotopes has many health implications and WHO was therefore particularly interested in the International Conference on Radioisotopes in Scientific Research held in Paris by UNESCO from 9 to 20 September 1957

The Conference which was attended by some 1200 scientists representing 61 countries and 25 international organizations was divided into two sections for the reading and discussion of original scientific papers. One section dealt with the use of radioisotopes in physics and chemistry and the other with their use in biology

Although the questions of radiation protection in relation to public health and the clinical uses of radioisotopes in diagnosis and treatment did not come within the terms of reference of the Conference WHO had the opportunity of presenting in co-operation with UNESCO four evening lectures on these subjects. They were "The general problems of the new permissible levels of radiation" by Dr Lauriston S. Taylor

Problems of waste disposal in the wide scale use of radioisotopes by Dr W. G. Marley Therapeutic uses of isotopes in medicine by Professor M. Tubiana and

Diagnostic use of isotopes in medicine by Professor R. Fauvert

### Course in radiation protection

From 30 September to 31 October physicians, physicists and engineers from eighteen countries in the European and Eastern Mediterranean Regions attended an advanced course in radiation protection organized by WHO in co-operation with the Belgian Government. The course took place at the Centre d'Etudes pour l'Energie nucléaire at Mol Belgium and included instruction in the general principles of health physics

supervision at reactors and radiochemical laboratories monitoring methods and dosimetry. It also dealt with safety factors in uranium and plutonium factories environmental hazards and reactor site selection waste disposal and safety factors in laboratory design

The course at Mol was the second international course in radiation protection to be organized by WHO the first of these courses was held in Stockholm in 1955

### International course on tuberculosis

The eighth international training course on tuberculosis was held from 7 to 26 October 1957 in Istanbul. This course for public health nurses and physicians—given in French and in Turkish—was organized by the Turkish Antituberculosis League with the collaboration of the Turkish Ministry of Health and Social Welfare and of WHO

Professor Tevfik Sağlam and Dr İsmail Gökçe were in charge of the course and several experts sent out by WHO participated in it including Dr E. Anjaleu, Director of Social Hygiene at the Ministry of Public Health and Population Paris, Dr E. Berthet, Director General of the International Children's Centre, Dr A. Lotte, Chief of the Tuberculosis Section of the National Institute of Hygiene Paris and Mlle F. Cornet, WHO nursing consultant

The course was attended by 17 physicians and 9 nurses from seven countries (Bulgaria, Israel, Poland, Spain, Syria, Turkey, Yugoslavia). The main emphasis was on the practical public health aspects of antituberculosis work on epidemiology, health education and medico-social activities

### Seminar on the Nurse in the Psychiatric Team

The WHO Regional Office for Europe in association with the Government of the Netherlands held a European Seminar on the Nurse in the Psychiatric Team at Noordwijk Aan Zee, Netherlands from 4 to 15 November. This Seminar was attended by nurses, psychiatrists and psychiatric



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#### Expert Committee on Insecticides

The eighth WHO Expert Committee on Insecticides met in Geneva from 18 to 23 November to consider problems of insect resistance and vector control. In 1956 the seventh Expert Committee on Insecticides had noted that the problem of resistance was growing more rapidly than the measures to deal with it and recommended that WHO act as a co-ordinating agency for research into the following aspects of this problem: the collection and dissemination of information, the promotion of needed research, the procurement of personnel and funds, the adoption of standard test methods, the procurement and testing of new insecticides, liaison activities and meetings and conferences.

As well as reviewing progress throughout the world in these fields during the past 15 months the eighth Committee made recommendations for test methods to determine the susceptibility to insecticides of insects of medical importance, notably adult mosquitos, on which a considerable amount of research had been carried out by a working group drawn from the WHO Expert Advisory Panel on Insecticides. The Committee also considered the establishment of a bioassay method for determining residues of insecticides on wall surfaces.

Finally the Committee drew up recommended methods for vector control with particular reference to the emergence of resistance to serve as a guide to field programmes on the conduct of vector control operations. Experts on vector control from all parts of the world have collaborated in providing data for the consideration of the Committee. The recommendations made at the meeting will be revised at regular intervals in accordance with scientific developments.

The experts invited to attend the meeting were Dr L J Bruce Chwatt, Senior Specialist, Malaria Service, Yaba, Lagos, Ni-

geria; Dr J R Busvine, London School of Hygiene and Tropical Medicine, London, UK; Dr Marshall Laird Macdonald, College of McGill University, Quebec, Canada; Dr T Ramachandra Rao, Assistant Director of Public Health (Malaria), Poona, India; Dr G Sacca, Istituto Superiore di Sanita, Rome, Italy; Dr S W Simmons, Chief Technology Branch, United States Public Health Service, Communicable Disease Center, Atlanta, Ga., USA.

#### Fifth Borneo Inter Territorial Malaria Conference

The Fifth Borneo Inter Territorial Malaria Conference, convened by the WHO Regional Office for the Western Pacific, was held in Labuan, North Borneo, from 26 to 28 November. It was attended by representatives from North Borneo, Brunei and Sarawak, and by WHO field staff working in malaria projects in these territories. The Malaria Adviser of the WHO Regional Office for the Western Pacific and a member of the Malaria Section of WHO Headquarters, Geneva, were also present.

The Conference reviewed the anti-malaria programmes in the three territories represented and the liaison problems involved. The agenda adopted also included such items of special interest as the use of anti-malarial drugs as a supplement to residual spraying, the relative merits of DDT and dieldrin and optimum spraying cycles, the problem of temporary farm huts, precautions to be observed in the use of certain insecticides, the resistance of malaria vector species to insecticides and the use of susceptibility tests, methods of evaluation of anti-malaria projects, supplies and equipment and the recruitment and training of local personnel.

The first of these inter territorial conferences was held in Kuching, Sarawak, in February 1956, the second in Marudi, Sarawak, in May 1956, the third in Kuching, Sarawak, in December 1956, and the fourth in Keningau, North Borneo, in April 1957. Their aim is to stimulate and co-ordinate



# CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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social workers selected by the governments of eighteen European countries

The Seminar discussed the role of psychiatric nurses not only in mental hospitals but in an increasing number of mental health services to the community. The psychiatric services of various European countries were examined and the functions of each member of the psychiatric team were discussed with particular reference to those of the nurse. During this discussion the basic and post basic training of psychiatric nurses was reviewed.

The main topics of the Seminar were introduced by lectures and then discussed by groups each consisting of 12 persons. Each group included members from the various disciplines taking part in the Seminar. The work of the discussion groups was reported to the Seminar as a whole at plenary sessions. The programme also included visits to mental health services in the Netherlands.

#### Inter Regional Conference on Leprosy

A WHO Inter Regional Conference on Leprosy will be held in New Delhi in 1958 for medical officers in charge of leprosy control services in the endemic areas of South East Asia. The Conference will take place immediately after the Seventh International Congress of Leprology organized in New Delhi by the International Leprosy Association with the collaboration of the Government of India.

The International Congress is attended by leprologists from all over the world and meets every five years for discussions on recent advances in all branches of leprosy work. This will enable the participants in the WHO Inter Regional Conference to benefit from conclusions reached by the Congress particularly in their practical application to their own national problems of leprosy control.

Proposals may also be made for special leprosy control activities either national or with international assistance such as the training of specialists for extended control programmes and the teaching of surgical and related techniques used in the rehabilitation of patients.

Two well known leprologists Professor J. Gay Prieto and Dr B. D. Molesworth will assist in preparing this Conference which is expected to be the first of a series of similar regional meetings.

Professor Gay Prieto, Professor of Dermatology at the University of Madrid, has already collaborated with WHO as leprosy consultant in Indonesia, Turkey, French West and Equatorial Africa and the Cameroons and was Vice Chairman of the organizing committee of the Sixth International Congress of Leprology in Madrid in 1953.

Dr D. Molesworth has directed the leprosy institution at Sungai Buloh, Malaya, for the last 11 years and has wide experience of the clinical and social aspects of leprosy.

**Dr M. G. Candau to remain Director General until July 1960**

Dr M. G. Candau, Director General of WHO, whose mandate would have expired on 21 July 1958, has accepted the offer made by the Tenth World Health Assembly to renew his contract<sup>1</sup> and has asked that this renewal be for a further period of two years.

Dr S. Al Wahbi, President of the Tenth World Health Assembly, has communicated Dr Candau's decision to WHO Member States and to the members of the Executive Board and informed them that he will sign the renewal of the Director General's contract on behalf of the Organization.

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*See also Wld Hlth Org 1957 11 19*

dark corners of houses biting in the evening mainly between 7 p.m. and 9 p.m. *M. uniformis* is a black mosquito which bites out of doors. Knowledge of the habits of the various vectors both as larvae and as adults is essential for their effective control.

### Symptomatology

The symptoms do not appear until 3 to 18 months after infection. Adenopathy which soon becomes generalized is followed at varying intervals by attacks of acute lymphangitis accompanied by fever and local pruritus of an allergic nature. It is only later in patients who have suffered frequent attacks of lymphangitis sometimes with secondary infection that obstruction of the lymph vessels occurs and in about 10% of these patients elephantiasis develops. The part of the body affected may increase to three or four times its normal size, the skin becomes rough and furrowed taking on the typical "elephant's leg" appearance, the scrotum may become enormously enlarged even reaching the ground in some cases.

Galliard states that doctors in Afeiers and Constantine observed 150 cases of febrile lymphangitis caused by *M. malayi* among French and North African soldiers who had been serving in Viet Nam. All of them recovered on returning home either spontaneously or after treatment with diethylcarbamazine. This confirms that serious and irreversible lesions such as elephantiasis develop only after long residence in an endemic area.

### Treatment

Symptomatic treatment includes massage, elastic bandages, sclerosing injections and surgical excision as well as the administration of acetylsalicylic acid, antihistamines, sulfonamides and antibiotics. In addition certain specific filaricides derived from piperazine are now available for chemotherapy. However, although many of the female filariae are killed by these products, some may survive with the doses usually used with the

result that microfilariae may reappear a year after treatment in some cases, thus making fresh treatment necessary.

The use of diethylcarbamazine (Hetrazan, Notezime, Banocide) was introduced by Hewitt et al. in 1947.<sup>4</sup> It is a piperazine derivative administered by mouth in a daily dosage of 2 mg/kg, three 10-day courses of treatment being given at intervals of two to three weeks. In the French and North African soldiers infected in Viet Nam who were given this dosage, Galliard found 15 months after treatment that the parasites had disappeared completely in 64% of cases and were reduced to 3% of their previous number in the remainder. In 1957 Kessel in Tahiti, using a dosage of 2 mg/kg three times daily for seven days, found that in 50% of the cases a second course of treatment was necessary after a year, owing to the reappearance of microfilariae. When the dosage was increased to 6 mg/kg one day each month over a period of two years, only 2% of the cases were positive at the end of treatment and all these were cured one year later. Diethylcarbamazine may thus be considered an effective drug. It acts by promoting phagocytosis of the filariae by the macrophages. The massive destruction of the filariae leads to secondary effects of an allergic nature, such as headache, articular pains and fever. These are partly relieved by acetylsalicylic acid or by antihistamines but nevertheless constitute an obstacle to mass treatment. Kessel also used suramin (Antrypol) in Tahiti in a dose of 1 g administered by intravenous injection once weekly for seven weeks. It brought about a fall in the frequency of attacks of lymphangitis but was more toxic than diethylcarbamazine.

### Prevention

A programme of filariasis control as carried out by Kessel in Tahiti and by Chow and Thevasagayam in Ceylon would include the following measures:

1. Determination of the percentage of persons positive for microfilariae and of the



cases also occurred later in some French and North African soldiers in Viet Nam

### Predisposing causes

Infection may occur at any age it is unusual however before the age of 20 and the maximum incidence is between 20 and 35 years of age. *Wuchereria filariasis* may be contracted in towns when it is transmitted by *Culex fatigans* or in the country where it may also be transmitted by anopheline mosquitoes. *Malaya filariasis* is a rural disease transmitted by *Mansonioides* mosquitoes. Both in mosquitoes and in man infection takes place mainly during the rainy season which may last for several months.

### Epidemiology

The adult *W. bancrofti* lives in the lymph vessels and nodes of man and is a thin worm up to 10 cm in length.

The microfilariae which measure 300 $\mu$  long and 8 $\mu$  wide live in the blood their numbers in the peripheral circulation showing a daily periodicity. In most parts of the world the largest numbers are present in the peripheral blood between 10 p.m. and 3 a.m. but during the day they disappear remaining dormant in the pulmonary veins until evening. In parts of Oceania however the numbers remain constant or show only slight fluctuations.

The microfilariae are taken up by the female mosquito during its blood meal. They penetrate the wall of the stomach after a few hours and migrate into the thoracic muscles where they develop into larvae. After two to three weeks the larvae move on to the proboscis from which they penetrate the skin when the mosquito bites.

The larvae then pass to the lymph vessels where they mature, mate and give rise to a new generation of microfilariae. These embryos pass through the thoracic duct and enter the blood stream. Man is thus the usual reservoir of infection but in Malaya and in India the parasite has also been found in various animals.

*W. bancrofti* is carried by several mosquitoes which may differ in different parts of the world. Most frequent is *Culex fatigans* Wied. which is the important vector in Brazil, Ceylon, India, Malaya, the Philippines and Samoa. *C. pipiens* is an important vector in China, Egypt, the Cameroons and French West Africa while the form *pallens* is found in China and Japan. These are all predominantly urban mosquitoes. In Ceylon the larvae of *C. fatigans* develop in the highly polluted water of catch pits, coconut husk pits, drains, gulleys and marshes (Chow C.Y. & Thevasagayam E.S.). The adult parasites, the majority of which are females, make their homes in houses, particularly in bedrooms, resting on furniture, clothing and mosquito nets which usually escape spraying with insecticides.

In Polynesia and especially in Tahiti according to Kessel *Aedes polynesiensis* and *A. pseudoscutellaris* are vectors in addition to *C. fatigans* (*quinquefasciatus*). They live in the forests and only enter houses occasionally to feed but do not remain there. Breeding places of the larvae are tree holes, rock holes, canoes, coconut shells and sea shells. The eggs can survive long periods of drought in any of these containers. The dispersal range of the mosquito is not more than 100 metres. In Africa and in particular in the Belgian Congo, Senegal and Tanganyika *Anopheles gambiae* and *A. funestus* are the important vectors of *W. bancrofti*. In Australia, Brazil, China, the New Hebrides and New Zealand it is transmitted by other anophelines. In India where the epidemiology has been studied by Raghavan *W. bancrofti* is transmitted by *C. pipiens* or by anophelines whereas the vectors of *W. malaya* are *Mansonioides*. The females lay their eggs on the under surface of the leaves of aquatic plants. When the larvae hatch they attach themselves to the under water stems of water plants from which they draw their oxygen. The pupae behave similarly afterwards detaching themselves from the stems and rising to the surface just before the adults emerge.

*M. annulifera* are small brownish mosquitoes which are silent in flight and rest in

mala and Mexico. In these countries it affects about one million inhabitants most of them working in coffee plantations. In the infected area of Guatemala which covers barely 2% of the country 60% of the population suffered from the disease before the introduction of control measures. By 1943 however the proportion had been reduced to 15% with blindness in 1% of the cases. The disease has recently been observed in Venezuela.

### Epidemiology

The adult male of *Onchocerca volvulus* is 3 cm long and the female 50 cm to 70 cm. The adults become encysted in subcutaneous nodules where they may live for years. The embryos are liberated into the nodules and migrate from there to all parts of the body but are most frequently found in the skin and eyes. They are rarely encountered in the blood. After ingestion by the fly vector they enter the digestive tube which they soon leave for the thoracic muscles where they develop into larvae. The latter then pass to the head and proboscis from which they escape when the insect bites. The vector of *Onchocerca volvulus* is always one of the simuliid species *S. damnosum* throughout Africa, *S. neavei* in the Belgian Congo, Kenya and Uganda, *S. ochraceum*, *S. metallicum* or *S. callidum* in Mexico and Guatemala. These flies inhabit humid and wooded areas near rapidly flowing turbulent rivers. The larvae and pupae of *S. neavei* attach themselves to the crab *Polatonautes*. Those of other species attach themselves to sticks or stones.

In Africa the proportion of flies infected varies from 3% to 15% depending on the area. In Mexico Mazzotti found that the proportion varied from 3% to 7% according to the species. In Guatemala where Dalmat carried out very thorough entomological surveys less than 1% of the flies are infected. Although an infective fly never carries more than three larvae the risk of infection for man may be as high as one worm every three minutes in some areas.

Among the numerous studies of the life cycle of the simuliids may be mentioned those made by Wanson and his co-workers in the Belgian Congo between 1948 and 1951 and those made by de Meillon in East Africa.

The female of *S. damnosum* lays her eggs numbering about 250 on the wet surfaces of stones or on the leaves or twigs of certain plants partly submerged in water. The eggs hatch shortly afterwards and the larvae enter the water and attach themselves to rocks, leaves or twigs. The aquatic stage lasts about two weeks after which the adults rise to the surface in a bubble of air. The females rest on vegetation which they only leave in search of blood or later to lay their eggs. The main source of blood is man but the fly may also attack various animals including birds, goats, donkeys and dog. It does not enter houses but bites in the open during the day usually near water. It shows a preference for the lower extremities except in Central America where its special target is the uncovered head.

### Symptomatology

The subcutaneous nodules which are firm and movable under the skin can be found in three-quarters of infected cases and are probably present even more frequently since the smallest and most deeply situated are easily missed. They do not appear earlier than eight months after arrival in an infected area. During the first few years the nodules always contain living encapsulated adult worms, eggs, microfilariae and more rarely caseous greenish pus. After 10 to 15 years they become softened and then contain only dead parasites. They are frequently found on the ribs, head, iliac crest, trochanter, knee, elbow, shoulder blades in the armpit or behind the knee. The symptoms vary according to the geographical region. In Africa the nodules occur principally on the body and limbs while in America they are mainly on the head. Whereas in Africa a very irritating skin eruption frequently occurs on the buttocks, limbs and neck with roughening and thickening of the skin in America it

density of the microfilariae in the blood by examination of 20 mm<sup>3</sup> of blood taken between 8 p.m. and midnight

2 Identification of the vector and determination of its breeding habits feeding habits and dispersal range estimation of the mosquito density i.e. the number of mosquitos captured on human bait for example 10 metres from houses in the course of 10 minutes determination of the infection rate of the mosquitos by dissection of the various parts—head trunk thorax abdomen—and counting the larvae present In Tahiti Kessel obtained the following values in 422 mosquitos

Mosquitos carrying larvae	132/
Mosquitos carrying infective larvae	76/
Number of larvae per mosquito	0.74
Number of infective larvae per mosquito	0.19

All the determinations should be carried out annually

3 Mosquito control by elimination of breeding places within a radius of 100 metres from habitations (treatment of holes in trees and rocks and of coconut husk pits as well as weekly emptying of cesspools drainage of stagnant ponds etc.) In Tahiti this work is usually entrusted to householders and monthly inspections are made Persons not complying with the regulations are liable to be fined All this needs to be preceded by a propaganda campaign so as to ensure the collaboration of the public This type of control is difficult It takes five to ten years to eradicate the mosquitos in a given area The number of mosquitos captured in houses is not greatly reduced by insecticide spraying of the rooms as the mosquitos do not rest indoors after feeding

4 Larvicidal treatment of the usual mosquito breeding places Both BHC in oily solution or in powder form and dieldrin in powder or granular form give excellent results Provided that large doses are used all the larvae are killed within two days The use of large doses is necessary because of the presence of much organic matter which absorbs the insecticide

5 Mass chemoprophylaxis and chemotherapy Diethylcarbamazine is administered in a dose of 6 mg/kg once a month for a year to the entire population including persons whose blood is free from microfilariae Annual examinations should be carried out and in patients whose blood still contains microfilariae treatment should be continued In Tahiti the filarial rate fell from 30% to 3% in three years more than half the positive cases were found in immigrants or people who had refused treatment Thus chemotherapy alone was sufficient to eliminate filariasis almost entirely The annual cost of the treatment per inhabitant was about US \$3

Individual treatment by mosquito netting in the home and the wearing of clothing out of doors should not be neglected

Owing to the diversity of local conditions the need for vector control alone chemotherapy alone or a combination of both will have to be decided on the results of the preliminary survey in each region

Although so far an attempt to prevent the disease had been made in only a few areas such as Ceylon and Tahiti the results are sufficiently encouraging to justify the hope that in the near future similar measures will be undertaken in all countries in tropical and sub tropical zones where the disease is endemic

## ONCHOCERCIASIS

(*Onchocerca volvulus* Leuckart)

### Geographical distribution and incidence

Onchocerciasis is endemic in two areas

In Africa it occurs in Sierra Leone Ghana Nigeria the Cameroons French Equatorial

Africa the Sudan the Belgian Congo Kenya Uganda and Tanganyika The prevalence varies from 5% to 100% and is most often between 30% and 50%

In America the disease is found in Guate

mala and Mexico. In these countries it affects about one million inhabitants most of them working in coffee plantations. In the infected area of Guatemala which covers barely 2% of the country 60% of the population suffered from the disease before the introduction of control measures. By 1943 however the proportion had been reduced to 15% with blindness in 1% of the cases. The disease has recently been observed in Venezuela.

### Epidemiology

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is more usual to find periodic crsipeloid lesions on the face and swelling of the ear

Both in Africa and in America between 10 % and 50 % of patients with onchocerciasis develop ocular lesions and 1 % to 3 % of these cases finally become blind. The lesions of the anterior part of the eye (keratitis and its complications) are probably caused by microfilariae in the tissues and media of the eye particularly by dead filariae which provoke an inflammatory reaction. It is probable that the frequency of these ocular manifestations is dependent upon the intensity of the infection according to some observers they are especially associated with nodules on the head

It has been suggested that lesions leading to blindness might be due to an allergic response or to toxins released by the dead filariae as they disintegrate and that the intoxication is more severe in cases of vitamin A deficiency. Experiments in guinea pigs and rabbits though still only at a preliminary stage do not appear to indicate that the ocular lesions have an allergic origin—at least as far as these animals are concerned. In man observations on the lesions of the posterior segment of the eye support the theory of a toxic rather than an allergic reaction. In any event the cause of bilateral lesions which almost invariably lead to blindness is still unknown. The administration of vitamin A produced an improvement in vision in some patients. It is possible that the optic atrophy which often accompanies the posterior lesions is favoured by the dietary deficiencies which are so common in Africa.

Opacity of the cornea in an eye that is otherwise healthy is not necessarily related to onchocerciasis. In a group of African youths for example 41 were found to have corneal opacities but none had onchocerciasis. However 60 % of those with corneal opacities had had an attack of malaria during the preceding month.

Although the lens may not be directly attacked it is affected indirectly by the lesions of the neighbouring tissues. It becomes opaque and as a result of degeneration of the suspensory ligaments finally

dislocates. The picture is in fact that of an onchocercal endophthalmitis sometimes complicated by secondary infection.

### Treatment

The nodules may be excised and an improvement in vision is sometimes noted after removal of nodules from the head. Treatment with diethylcarbamazine or suramin brings about an improvement by destroying the microfilariae. The side effects which consist of febrile reactions itching dermatitis painful swelling of the nodules arthritis headache nausea etc are attributed to an allergic reaction following the massive destruction of filariae. They may necessitate a temporary interruption of treatment and the administration of antihistamines. As in the case of bancroftian filariasis a single course of diethylcarbamazine is not always sufficient to ensure the permanent disappearance of the microfilariae and a second course may be needed after six or eight months. Great caution must be observed in the administration of suramin owing to its high toxicity.

### Prevention

Since the simuliids breed on plants and rocks in rapids and cascades and their larvae live in the water the only effective measure against the larvae is the addition of a larvicide to the watercourse upstream. It is also necessary to treat the other rivers in the area at the same time in order to prevent the larvae migrating from one to another. The effective concentration of DDT is 0.5 parts per million of water maintained continuously for 30 minutes every tenth day. Carried out over a period of three months this treatment ensures the eradication not only of the larvae which live only 14 days but also of the adults which live for two months. In order to estimate the amount of DDT required it is necessary to measure the discharge of the rivers. Several methods are available for this purpose (weirs acoustic or mechanical meters floats). Spraying of DDT from the air on vegetation along the banks of watercourses has been used success-

fully to destroy the adult flies along the Congo rapids where the volume of water that would need treating with DDT is enormous. However this method is obviously expensive.

The destruction of simuliid larvae in watercourses is to be recommended and should be undertaken as soon as possible in all cases where ocular complications of onchocerciasis are frequent.

## THE SORPTION OF INSECTICIDES ON MUD WALLS

The development of insecticide resistance in anopheline vectors prompted the Eighth World Health Assembly in 1955 to pass a resolution sponsoring a programme having as its ultimate objective the world wide eradication of malaria. The idea was that if malaria could be eradicated quickly resistance would not have time to develop. Although results have on the whole been very satisfactory it has been reported that residual insecticides sprayed on certain types of mud walls ceased to become available to the insect after a comparatively short time. This is explained by sorption of the insecticides i.e. by their penetration into the material of which the walls are constructed. In certain areas it is considered that this phenomenon exerts an adverse effect on the success of the eradication programmes so that a solution to the problem is a matter of urgency.

A co-ordinated programme of research to study sorption of insecticides on mud walls was initiated by WHO a few years back. To give impetus to these studies a series of informal talks was arranged by WHO in Geneva in July 1957 between certain members of the Expert Advisory Panel on Insecticides and the Secretariat of WHO.

The problem may be attacked in two ways firstly by reducing the sorptive capacity of the soils used for constructing the walls and secondly by developing new formulations of insecticides which are less liable to sorp-

tion. In studies planned by WHO which are being carried out in Zanzibar and the Sudan the insecticide is being sprayed on walls constructed from soils the activities of which have been determined beforehand. Observations will be made at intervals over a long period and the progressive reduction in biological activity examined. A similar study is in progress in Mexico under the auspices of the Pan American Sanitary Bureau, WHO Regional Office for the Americas.

Studies of this kind are at present hampered by the absence of a reliable method for estimating the amount of insecticide present at a surface and by the fact that the exact relationship between concentration of insecticide on the surface of a sorptive mud and biological efficacy is not known.

The members of the group therefore considered that the work must proceed in two stages: (i) a pilot project planned and executed by highly-qualified and experienced staff to compare chemical deposits with biological efficiency; (ii) a routine malaria control programme in which the techniques developed in stage (i) are used as routine procedures.

In the sixth report of the WHO Expert Committee on Malaria, the hope was expressed that "the Expert Committee on Insecticides will examine and report on sampling of deposits on wall surfaces and on the estimation of insecticide in the sample".<sup>1</sup> The difficulties involved in such an investigation were discussed by the group under four separate headings:

<sup>1</sup> Those attending were: Dr M. E. Alessi, of the S. Perouse, San A. Rome; Dr R. A. E. Galley, of the Colonial Res. Inst., London; Dr G. W. P. of the U. of S. Pub. H. Service, N. Y.; Dr J. Trebow, of J. R. Gray, L. & Basle.

#### Determination of the activity of the soil used for making the huts

No simple method of determining the sorptive capacity of soils is at present available for field use. Several laboratory methods have been suggested for example the carbon tetrachloride method of Barlow & Hadaway<sup>3</sup>. However this is suitable only for highly active soils and is unreliable with less active muds. The only reliable method at present available is to apply a suspension of insecticide crystals to the soil and observe the rate of disappearance under controlled conditions of relative humidity and temperature. Here again however the results are not strictly comparable with those obtained under field conditions where wettable powders containing inert fillers are used rather than suspensions of pure crystals.

#### Determination of the amount of insecticide applied

A widely used method of sampling is the application to the soil surface at different heights around the walls of the hut of small strips of absorbent paper. After spraying the strips are removed and their insecticide content determined. A disadvantage of the method is that the operator tends to pay particular attention to the paper strips when spraying. As a check the foreman should note the total amount of insecticide sprayed in the hut and the area of the walls. In this way a fair assessment of the average rate of application can be obtained. It must be remembered however that even the best spray teams are unable to produce a completely uniform deposit.

Other techniques which have been suggested including the insertion of small squares of mud in specially prepared recesses in the walls are too laborious to be of practical value.

#### Determination of the surface concentration of insecticide at intervals after spraying

Of a number of sampling techniques which have been described two have been found

perfectly satisfactory for following the movements of insecticides in the laboratory under controlled conditions and on smooth surfaces. Neither of them is suitable however for use as a routine method in the field where all types of mud surface—rough smooth soft hard crumbly—may be encountered. The group felt that the effort needed to overcome this difficulty would be very great and might be out of all proportion to the value of the results obtained.

The two sampling techniques referred to above depend upon the use of Sellotape and of silicone treated paper and were described by Barlow<sup>4</sup> and Alessandrini<sup>5</sup> respectively. The advantages and disadvantages of the two techniques are compared in Table I.

A third method is being developed in which carboxymethyl cellulose films are sprayed on the surface under examination. It is premature at present however to consider its possible application to the widely different surfaces encountered in the field.

The group considered that the limitations of the techniques at present available have been insufficiently appreciated and the effort necessary to convert them to working field techniques underestimated. In order that work can proceed without delay they recommend that efforts should be concentrated on adapting the surfaces of the huts to existing techniques rather than on finding methods to fit the rather heterogeneous miscellany of surfaces found in practice. Such a procedure would be particularly suitable for the first stage operation—the pilot project—in which more highly skilled workers are expected to be available to take samples and make observations. Its use in a routine malaria control programme would be possible only if the wall surfaces to be tested were prepared in advance and skilled supervision were continuously available.

The group felt strongly that a bioassay technique would offer advantages unlikely to be equalled by any chemical method now available or likely to be developed in the next

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R C F f s p S s ( 1 9 5 6 1 9 1 6

B l o w F & H d w a y A B ( 1 9 5 5 ) B R I R 4 6 5 4 7

TABLE I. COMPARISON BETWEEN THE SELLOTAPE AND SILICONED PAPER SAMPLING TECHNIQUES FOR FOLLOWING SORPTION OF INSECTICIDES IN THE LABORATORY

<p>Comm l p o d t o p p a t q d</p> <p>Adh t w l l w h t b e g h d d s l l w h</p> <p>Q d s r f a s t n e t d r g h e</p> <p>N t t b l f t m b l y w l l b m h t</p> <p>Reco ry f e t d e v s w l o p l d t</p> <p>l i r f w h m e t l m l m t h d f</p> <p>Tra are l S m d t h t b g d f h</p> <p>F l b l d f l o f l y m l l g t f m d</p> <p>D r h l a d l o t f d r l l l p</p>	<p>St ned p pe</p> <p>Pract eg d to o p l y g h t m o n t i g e a</p> <p>M f i b e t l d w l l C o d b l s h l l e d d t d o</p> <p>R c g r a t l y t o w t h w h t a p p r t l l y</p> <p>C a b s d m c h s o l t w a l l t h t a p b e c t</p> <p>R c r y o f c t d l s v a w h p s e</p> <p>D o e o t t r f w h l m i t c a l y s s m l l y s</p> <p>Q a a l m n d b l t s e s d e g r e f c t a c t</p> <p>R l n l y f f l w o v e p a r t l y e l n a b l y o f</p> <p>E t t f w e t e d m c h e s e e d q c k e t h</p>
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few years and that despite the difficulties attempts to develop a suitable bioassay technique would be more likely to pay dividends than chemical investigations. They recommend that as soon as a biological method capable of giving consistent results has been evolved it should be given preference in the field but should be supplemented by chemical estimation to provide comparative data.

### Methods of analysis

It is unlikely that simple field techniques for the accurate analysis of samples will be developed in the near future. Although it is

possible that some existing methods could be used in small field laboratories the group recommends that in general chemical analyses should be carried out in reasonably well-equipped laboratories. Several widely used methods are available which have given consistent results when applied to a number of problems.\*

There are three possible sources of error in the chemical analysis of samples from test surfaces (i) experimental error in the analysis itself (ii) uneven application of the

The group prepared table listing the pros and cons of the different methods, the principle of each method and the reference to its origin description. A limited number of copies of this table are available on application to the Division of Environmental Sanitation, World Health Organization, Geneva.



insecticide to the surface (iii) error of sampling

The available evidence indicates that (i) is of secondary importance compared to (ii)

and (iii) The group therefore felt that no advantage would be gained by taking several samples from the same area of wall and analysing them in different laboratories

## NEW EDITION OF THE INTERNATIONAL CLASSIFICATION OF DISEASES

The International Classification of Diseases (1955 revision) and the WHO Regulations concerning its use will come into force on 1 January 1958 in sufficient time for Member States to compile their mortality and morbidity statistics in accordance with the new rules before the censuses which are to take place in many countries in 1960 and 1961

At the Ninth World Health Assembly the report of the International Conference for the Seventh Decennial Revision of the International Lists of Diseases and Causes of Death was welcomed by the Director General of WHO as an important step forward in the process of improving and making more uniform and therefore more valuable statistics of morbidity and mortality<sup>1</sup>

Before dealing with specific aspects of the new Classification it is perhaps fitting to recall the work of WHO over the last 10 years in the field of health statistics and to give a brief historical review of the subject

### Historical review

The comparability and consequently the efficacy of health statistics are closely linked with the solution of a related but much older problem namely that of medical nomenclature. In the eighteenth century a certain number of naturalists and physicians attempted to work out a uniform and methodical classification of disease in order to facilitate comparison of their findings and results. Their aim was to exchange diagnostic information of a qualitative nature and

this called for nomenclatures which would be as detailed and complete as possible. An example is the *Nosologia Methodica* of Sauvages.

During the nineteenth century the problem of nomenclature again arose although in a very different form when social medicine and health statistics applied quantitative methods to the sciences of life for the first time.

Instead of a complete and specific list giving a separate description of every known pathological condition what was needed was a classification which would make it possible to enter all morbid conditions under a limited number of headings and to supply quantitative information concerning groups of cases.

In 1853 the First International Statistical Congress took one of the earliest steps in the field of international medical co-operation when it attempted to establish a Nomenclature uniforme des Causes de Dcès which would be generally recognized but this and subsequent efforts had little result until the acceptance in 1893 of the three classifications proposed by Bertillon.

Bertillon's classifications based on the distinction between general diseases and those localized anatomically and establishing the principle of selection of the underlying cause as cause of death was adopted by several countries. It soon became apparent that advances in medicine and changes in medical terminology would necessitate the periodic revision of this classification. At the suggestion of the American Public Health Institute a system of decennial revisions was adopted in 1899 by the International Statistical Institute. Accordingly

the French Government which had been given the task of organizing these revisions convoked at Paris in August 1900 the first International Conference for the Revision of the International Classification of Causes of Death. Subsequent revisions took place in 1909, 1920, 1929 and 1938, the last two revisions being carried out with the collaboration of the Health Organization of the League of Nations. In 1938 the International Conference for the Fifth Revision of the Lists wishing also to improve the international comparability of morbidity statistics decided to extend the scope of its work so as to include non fatal diseases and to draw up a list of these diseases on the same lines as the International List of Causes of Death. Various national lists of a similar nature were in fact already in use but they were unsuitable both for purposes of statistical classification and in particular for those of tabulation.

In 1945 in accordance with a resolution of the International Conference for the Fifth Revision of the Lists the United States Committee on Joint Causes of Death whose members included representatives of the Canadian and British Governments considered the establishment of such a list. Finding that the two types of nomenclature did not differ in structure since they were both concerned with the same stage of the disease namely the onset of the pathological process the Committee decided to combine the two lists and prepared a draft entitled *Proposed Statistical Classification of Diseases, Injuries and Causes of Death* which was the first document to provide a common basis for the establishment of both types of statistics.

It was at this stage that the problem of the International Lists was referred to the World Health Organization. There were two reasons why WHO should undertake this work firstly because the Organization was obliged by its Constitution to promote the development of health statistics throughout the world as well as the revision of the International Lists and secondly because WHO had been asked by the International Health Conference to undertake the preparatory work in connexion with the International

Conference for the Sixth Revision of the Lists. For this purpose the WHO Interim Commission set up an expert committee whose work based on the draft classification of the United States Committee on Joint Causes of Death had as its outcome the "International Statistical Classification of Diseases, Injuries and Causes of Death". This Classification was circulated for examination to the national administrations of Member States preparing morbidity and mortality statistics revised in accordance with their suggestions and provided with a tabular list of the diseases appearing under each title.

The International Conference for the Sixth Revision which met at Paris in 1948 adopted the Classification approved the principle of entering the underlying cause as the principal cause of death recommended the use of a standard form of medical certificate of cause of death and requested the First World Health Assembly to issue in accordance with its constitutional powers regulations concerning the Classification and calculated to ensure its general use.

The Classification together with rules for selection of the underlying cause of death for entry on the medical certificate as well as special lists for the tabulation of statistics and accompanied by the WHO Nomenclature Regulations No. 1 was published in two volumes in 1950 and 1952 under the title of *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*.

The *Manual* came into force on 1 January 1950. Despite the imperfections inevitable in any new undertaking this Classification marked a considerable advance in the field of the international comparability of health statistics and there can be no doubt that it has been of great value in practice.

#### Activities prior to the Seventh Revision

After the appearance of the *Manual* WHO took various steps to encourage its use in the establishment of national health statistics and

to solve problems which might arise in the practical application of the new standards

Certain sections of the Classification particularly those concerning the causes of still birth the categories for which had proved in practice to be too few or insufficiently specific were re-examined by the Expert Committee on Health Statistics

National committees on vital and health statistics whose formation had been urged by the Conference for the Sixth Revision, were established in many countries. Anxious to encourage the activities of these new bodies and to promote their development WHO has created a focal unit for liaison which supplies them with information and documents and ensures exchange of information between them. Furthermore in collaboration with the United Nations WHO convened in 1953 an International Conference of National Committees on Vital and Health Statistics<sup>1</sup>. Finally in January 1951 a WHO Centre for Classification of Diseases was established at the General Register Office of England and Wales with the aim of facilitating by means of comments and advice the correct and uniform use of the medical certificate and the *Manual* and of collecting all observations and data concerning them which might be of service at the next revision conference

## Seventh Revision of the Lists

The Conference for the Seventh Revision which met at Paris in 1955 considered that the period of time elapsing since the entry into force of the *Manual* was too short to justify any radical change in the Classification. It therefore decided to restrict itself to such changes as were compatible with a limited revision.

Thanks to the observations of the WHO Centre for Classification of Diseases the Conference was able to extend and simplify the rules for classification of the cause of death to be entered on the medical certificate. On the other hand a re-drafting of the section on causes of still birth was considered to be

premature and the Conference recommended that study of this question be continued for a few more years. Only WHO Nomenclature Regulations No. 1 underwent any extensive change experience having shown that the obligations imposed on Member States as regards the establishment and communication of their national statistics considerably exceeded their possibilities and sometimes their needs in this connexion. These obligations have been lightened and the rules relaxed so as to allow Member States greater latitude in the choice of the type of statistics to be established and communicated.

The work of the Conference for the Seventh Revision was approved in 1956 by the Ninth World Health Assembly which requested WHO to prepare a revised edition of the *Manual*; this was published in 1957<sup>4</sup>.

## The new edition

The Classification includes a certain number of new categories for non fatal diseases and injuries which will help to make the tabulation of morbidity statistics easier.

However—and this point must be stressed—the list does not claim to be an exhaustive nomenclature of all known pathological conditions and the choice of sections and categories complies with the needs of statistical classification—for which the importance and frequency of a disease are decisive—rather than with those of strict medical logic. In exceptional cases where the diagnostic details recorded do not correspond to any of the categories in the Classification it will be possible to enter them under a residual category placed at the end of each section.

The major divisions of the Classification more or less correspond to those of the preceding Lists i.e. the general diseases are grouped according to etiology and the others according to anatomical site. The Detailed List which constitutes the basic element of the Classification includes nearly

a thousand categories numbered according to a three figure decimal system which is explained in great detail. We shall do no more than mention here that with this system it is possible thanks to gaps left in the sequence of numbers to add new categories without changing the order of classification.

Only a limited number of categories can be used for the tabulation and publication of health statistics so that it would be difficult to use the Detailed List. For this reason the *Manual* includes three restricted lists whose use is recommended: an Intermediate List of 150 causes, an Abbreviated List of 50 causes for the tabulation of mortality and a "Special" List of 60 causes for the tabulation of morbidity for social security purposes.

For certain types of work these restricted lists are more handy than the Detailed List; furthermore they are simple to use and can be readily employed even in countries where medical personnel is still numerically inadequate. In some cases depending on the nature of the statistics to be established these lists may be extended by the addition of categories taken from the Detailed List. However it is considered essential that causes be always coded according to the numbers of the Detailed List whatever the list employed.

### Some problems of classification

The Detailed List of categories is followed by a tabular list of 310 pages indicating the precise diagnostic term or terms included under each category. As this table is intended for use all over the world by physicians of different ages and with different training it has been judged advisable to include all diagnostic terms which are more or less in current use. Thus certain of them are repetitions, others are obsolete and—in the light of recent discoveries—a few are even medically incorrect. However as such terms frequently appear on medical certificates the compilers have been obliged to include them so as not to detract from the value of the Classification.

Similarly the structure—sometimes disputed—of certain sections is not entirely satisfactory. The section "Mental psychoneurotic and personality disorders" in particular has met with some criticism. But the compilers cannot be held responsible for the apparently faulty arrangement of this section: it merely reflects the wide divergency of medical opinion in this field as regards classification and etiology. Again the inclusion of a disease in a given group may appear advisable or inadvisable depending on whether it is regarded from the angle of the clinician or that of the statistician. The viewpoint of the latter has sometimes prevailed. Thus "Rheumatic fever" (Nos. 400-402) which etiotomically speaking has nothing to do with the circulation has been classified under "Diseases of the circulatory system" in view of the frequency of cardiovascular sequelae.

Finally differences in terminology both within one language and between different languages have given rise to considerable difficulties. The same term may have two completely different meanings in the medical usage of the English and French speaking countries and consequently will not occupy the same position in the list thus complicating the work of the coders.

The establishment of this tabular list, the selection in each case of the most suitable generic term and its translation into the two other official languages—all this represents a considerable effort which it will be possible to improve still further in the light of the comments and suggestions of those using the *Manual*.

### Rules for the use of the Manual

In this connexion only minor changes have been embodied in the 1957 edition. As regards mortality statistics the 1950-1952 *Manual* following the 1948 revision has proved its worth: the adoption of the International Medical Certificate and the rules for the selection of the underlying cause of death have greatly facilitated the compilation of these statistics and increased their international comparability. However experience

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showed that the rules concerning the use of the Certificate involved certain ambiguities which were very inconvenient in practice. Thanks to the work of the United States Committee on Joint Causes of Death as well as the data and observations collected by the WHO Centre for Classification of Diseases these rules have been re cast extended and simplified.

It has been found that the *Manual* is being more and more widely used for morbidity statistics. This is a cause for satisfaction previously morbidity statistics were not comparable the fact that comparison between them is now possible will doubtless lead to findings of the greatest medical interest. However the *Manual* which gives specific details on the establishment of mortality statistics scarcely deals with the application of the Classification to morbidity statistics. This arises from the fact that disease has a bearing on the most varied aspects of social life (heredity malnutrition work capacity etc) and may be used as a basis for health statistical surveys of widely differing kinds. The application of the *Manual* will therefore vary according to the nature of the morbidity investigation contemplated and the purpose of the statistics. It is to be hoped that the experience gained in this field will soon make

it possible to formulate general rules for the classification of data relating to morbidity.

## Conclusion

In its present form the Classification represents a considerable advance on that of 1948. Its users will probably already be more familiar with the very special problems of health statistics a technique which is relatively new and capable of rendering services of the greatest value to health but which has perhaps not enjoyed all the publicity it deserves.

In health statistics as the combination of two radically different sciences some degree of compromise is inevitable and the 1955 Classification—as its compilers admit—is no exception to this rule. Nevertheless it must be hailed as the invaluable working tool that had been sought in vain for some sixty years. It is an achievement which in the words of the Director General of WHO will for long remain one of the outstanding examples of the benefits which Member States can derive from international organizations and which scarcely could have been obtained without them.<sup>5</sup>

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## Malaria

This is a most interesting volume dealing with changing strategy in malaria control. In fact one may gain the impression that it advances beyond the long existing concept of malaria control and presents the new theory of malaria eradication not omitting however the well-established methods of malaria control practice in order to effect malaria eradication. It stresses however the technical standpoint that nothing has come forward to change the now generally accepted opinion of malariologists that malaria eradication is the only national objective of an antimalaria campaign. It covers quite extensively the subjects of eradication insecticide resistance entomological investigations epidemiology and prophylaxis.

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## Reports of Expert Groups

### THE PROBLEM OF JUVENILE EPILEPSY

One of WHO's first activities in the field of mental health was to help the Neuropsychiatric Clinic of the University of Vienna Austria to set up a juvenile epilepsy department. In the course of this work it came to light that epilepsy despite its importance is a disease still somewhat neglected by physicians misunderstood by the public and almost completely ignored by statisticians. It became increasingly clear that a thorough study of the disease from the public health viewpoint was urgently called for.

To this end a group of specialists in various disciplines from a number of European and American countries met in London in October 1955 to study the physiological, psychiatric, genetic and above all social aspects of the problem of juvenile epilepsy. This study group was concerned with the disease during the first twenty years of life and considered as genuinely epileptic only the "clinical forms of attacks that are known by electro-encephalographic (EEG) and other investigations to be accompanied by the characteristic electrical activity of the brain recognized as epileptic".

The report of the Study Group on Juvenile Epilepsy is all the more welcome since the recent introduction of methods such as the pentetrazol (Cardiazol) test and the electroencephalogram has led to great advances in the understanding of the disease as well as in its treatment.

The transitory nature of the initial epileptic attacks and the hushup of more serious cases clearly make it difficult to obtain reliable statistics and this explains the paucity of the statistical data at the Study Group's disposal. The figures available cover

only a small number of cases and do not permit even an approximate evaluation of the incidence of epilepsy in Europe. They do however reveal the useful information that about 5% of infants have one or more fits before the age of three years, that in most cases such fits do not recur and that continuing attacks are most likely to appear during puberty.

Knowledge of the pathogenesis of epilepsy is still inadequate. The work carried out by Huehlings Jackson at the end of the nineteenth century on lesions of the cerebral cortex and the focal localization of the epileptic discharge has made it possible to explain the mechanism of the motor disturbances which appear during certain seizures but throws no light on the pathological processes involved in the disturbances of consciousness and behaviour encountered in other forms of epilepsy.

There are two types of epilepsy that are distinguishable according to the site of the epileptogenic zone: temporal lobe epilepsy and centrencephalic epilepsy. The course and treatment of these two forms of the disease are different. In more and more cases electro-encephalographic examination shows that the disease originates from a cerebral lesion but there is still no explanation why certain lesions are epileptogenic while others are not—a problem which biochemistry may soon be called upon to solve.

In the interests of clarity the group decided to consider the complex question of the etiology of epilepsy under two main headings: acquired and hereditary factors. Here it may be mentioned in passing that it is the acquired factors (cranio-cerebral traumas and certain infectious agents) which are most likely to harm the intelligence of the



patient and that hereditary factors while of some importance from the sociological view point can be regarded as involved only when there are seizures of the centrencephalic type particularly shortly after birth

The above factors provide only a rough working classification however Physicians are frequently faced with cases of unknown etiology especially when the disease is accompanied by behaviour disorders In these cases environmental factors such as family atmosphere and social pressures may come into play and render diagnosis difficult Furthermore behaviour disorders—fairly common during childhood—may be unrelated to epilepsy so that the physician must not leap to hasty conclusions and should be extremely cautious in making his pronouncements

The technical diagnostic equipment required the nature of the treatment and the thorough knowledge of the home environment of the patient which is so essential all make it preferable for epileptics to be cared for in specialized centres where there is close collaboration between epileptologists paediatricians and social workers Such centres exist in Great Britain and the Netherlands The Study Group while appreciating the special facilities of these two institutions<sup>2</sup> points out that by their very nature they tend to work in an isolation prejudicial to case finding To be completely effective such centres should keep in close touch with family doctors win their confidence and secure their co operation so that new cases can be referred to the centres before the patient's family has noticed the epileptic nature of the initial attacks

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Finally the report points out that although the incomplete knowledge of the etiology of epilepsy still makes prevention difficult much can be done to improve diagnosis and treatment Here the psychosociological approach is all important Public opinion must be influenced and old prejudices overcome Despite the old wives tales which surround it epilepsy is only a symptom and must be treated as such if it is to be effectively combated

<sup>2</sup> Child Guidance Clinic, Ministry of Health London  
Epilepsy Meeting in the Netherlands

## Notes and News

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### Regional Committee for the Americas

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After two weeks devoted to its detailed examination, the Council approved the programme of activities for 1958 covering about 160 health projects to be implemented by the public health administrations of the respective countries with the collaboration of the Pan American Sanitary Bureau (WHO Regional Office for the Americas). The PASO budget for the year's activities amounts to \$3 000 000 which is an increase of \$600 000 over the Organization's 1957 budget. The World Health Assembly has already approved a contribution by WHO of \$1 558 000 for the financing of part of the programme and it is also hoped to obtain about \$1 775 000 from the United Nations Technical Assistance Programme.

The Council was also required to examine the proposed programme and budget for 1959 amounting to \$4 000 000.

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The Council adopted 38 resolutions, one of which recommended the Director to continue his examination of the programme for the award of study fellowships to public health personnel in order to see what can be done to improve this programme which is one of the Office's principal means of strengthening national health administrations.

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the formulation of recommendations for their standardization. The pfn also includes the organization of training courses laboratory services for the analysis and testing of drugs and consultative services to assist countries in the development and improvement of their food and drug services.

The Council examined in detail all the public health programmes in which PASB's collaboration has been requested. These programmes cover the whole range of public health activities and may be divided into four large groups as follows:

(1) eradication campaigns i.e. in order of importance: eradication of malaria eradication of *Aedes aegypti* the vector of yellow fever eradication of yaws and eradication of smallpox.

(2) control of other communicable diseases including tuberculosis leprosy poliomyelitis and influenza by prevention or the latest more effective treatments.

(3) strengthening of national health services with emphasis on development of plans and more effective means of evaluating current programmes.

(4) new public health activities including those concerned with chronic diseases occupational health control of foodstuffs and drugs and the study of public health aspects of the peaceful uses of atomic energy.

In presenting his annual report the Director of the Office stressed the necessity for long range planning of the public health programmes which Member States of the Organization propose to implement particularly with respect to those for the strengthening of national and local health services expansion of professional training facilities and co-ordination of eradication programmes.

The Council approved another proposal by the Director for the transfer of the Zone Office for the Caribbean from Kingston, Jamaica to Caracas, Venezuela. The new Zone Office will cover the Caribbean territories and the Republic of Venezuela.

As usual some time was devoted to technical discussions and this year they dealt

with the improvement of methods for the evaluation of health programmes.

On 25 September a special meeting of the Directing Council was held to commemorate the tenth anniversary of the Constitution of the Pan American Sanitary Organization.

Every four years the Directing Council session is replaced by a meeting of the Pan American Sanitary Conference and this will hold its fifteenth session from 21 September to 6 October 1958 at San Juan, Puerto Rico. It will also constitute the tenth meeting of the WHO Regional Committee for the Americas.

#### Committee on International Quarantine

By direction of the World Health Assembly the Director General of WHO annually convenes a Committee on International Quarantine to review the functioning of the International Sanitary Regulations and consider other aspects of international traffic relating to quarantine.

At its 1957 meeting which took place in Geneva from 21 to 25 October the Committee noted that the International Sanitary Regulations have now become practically a universal code of quarantine practice binding some 170 States and territories and applied to a large extent by the few remaining States.

Other matters considered by the Committee included the 1957 influenza pandemic the importation of smallpox by international travellers into 18 countries in 8 of which epidemics broke out as a result and the danger of introducing malaria subjects or insecticide resistant malaria vectors into countries which are free of them.

The Committee discussed the possibility of travellers reintroducing malaria into countries that had eradicated the disease but decided that it was too early to amend the International Sanitary Regulations and officially to declare malaria a quarantinable disease. It suggested that no special anti-malaria measures should be imposed on international travellers but that antimalarial treatment could be given to migrants seasonal workers or pilgrims as a safeguard against the reintroduction of the disease.

The following were members of the Committee: Dr B M Clark (Union of South Africa), Professor A Halawani (Egypt), Or C K Lakshmanan (India), Dr L H Murray (United Kingdom), Professor E G Nauck (Germany), Or Stevo Pošlonček (Yugoslavia), Or C B Spencer (United States of America) and Or O Vargas Mendez (Costa Rica). Or F de Tavel, Medical Adviser ICAO, attended the meeting as an observer.

### Seminar on veterinary public health

In view of the growing number of diseases known to be transmissible from animals to man (zoonoses) and the need for hygienic control of foods of animal origin, it is essential that there should be close co-operation between veterinarians and the public health services. A seminar on veterinary public health was therefore convened in Warsaw from 25 November to 5 December by the WHO Regional Office for Europe with the participation of FAO. Its purpose was to promote the establishment of veterinary public health services and to strengthen existing services of this type in the countries of the European Region.

The seminar was divided into two parts: the first week being devoted to discussions on general matters relating to veterinary public health, including the interrelationship of human and animal health and disease, the control of food and other products of animal origin, reporting of the zoonoses, the organization and administration of veterinary public health services, the training of undergraduate and post graduate veterinary personnel and co-operation between medical, veterinary, sanitary and allied disciplines. The second week was taken up with discussions and demonstrations on six important zoonoses, namely tick-borne encephalitis, rabies, leptospirosis, toxoplasmosis, dermatophytosis and brucellosis.

The experts who acted as discussion leaders at the seminar included Dr B Babudieri (Italy), Or O Blaskovic (Czechoslovakia), Dr W C Cockburn (United Kingdom),

Dr E Holager (Norway), Or A Jepsen (Denmark), Dr M Kaplan (WHO), Dr E N Pavlovsky (USSR), Dr C. La Touche (United Kingdom), Or J Sum (Denmark), Dr J H Steele (USA), Or O Studic (Yugoslavia) and Dr R Vuillaume (France).

The Warsaw seminar was the third of its kind to be convened by the WHO Regional Office for Europe with the co-operation of FAO. The first was the WHO/FAO seminar on zoonoses held in Vienna in November 1952 at which medical and veterinary officials from 22 different countries discussed bovine tuberculosis, leptospirosis, Q fever and rabies. This seminar led to the publication of the monograph *Advances in the Control of Zoonoses* issued jointly in 1954 by WHO and FAO. The second was the WHO/FAO seminar on meat hygiene held in Copenhagen in February 1954 and led to the publication of the monograph *Meat Hygiene* in 1957.

### Rural health in South East Asia

Rural health services in the countries of South East Asia should be expanded and governments should give them more financial support. Environmental sanitation, the lack of which is a problem common to these countries, should receive special attention in all rural health programmes in the Region.

These were among the conclusions reached by a WHO-sponsored Rural Health Conference held in New Delhi from 14 to 26 October during which delegations from Afghanistan, Burma, Ceylon, India, Indonesia, Nepal and Thailand reviewed various rural health problems with the aim of finding solutions which would be applicable to some extent in all their countries.

The Conference recommended that rural health units should each serve a population of between 20 000 and 30 000 persons and that they should deal with the major health problems of the areas in which they are situated, including medical care. The minimum staff for a rural health unit should consist of 1 medical officer, 1 public health nurse or health visitor, 1 sanitary officer, 1 midwife for every 5000 persons in the area.



and 1 sanitary assistant for every 10 000 to 15 000 persons. One staff member of each unit should be a specialist in health education.

Special training in public health and preventive medicine was recommended for all categories of professional workers entering the rural health services. These workers should also receive more adequate information and guidance on questions of nutrition since malnutrition is an important source of ill health throughout the Region.

Better provision for inpatient medical care at rural health centres and hospitals was also advocated by the Conference and the need for the collection and exchange of information on rural health problems and developments was strongly emphasized. Finally it was suggested that national seminars on rural health should be held periodically with WHO assistance and that further Rural Health Conferences should be held in the various countries of the Region in turn.

#### Teaching of preventive and social medicine

A WHO sponsored study group on the teaching of preventive and social medicine in the countries of the Western Pacific Region was held in Manila from 16 to 29 October. Professors of preventive medicine and deans of medical schools from the following countries and territories were invited to take part: Australia, Cambodia, China, Fiji, Hong Kong, Japan, Korea, New Zealand, Philippines, Singapore and Viet Nam.

The study group discussed various questions relating to the organization of a Department of Preventive and Social Medicine at a medical school including curriculum, teaching methods, relations with other departments of the school, role in community health activities and comprehensive health care and research work.

#### Seminar on maternal and child health

The health of mothers and children in the Eastern Mediterranean Region continues to be a major concern of health administrators for although accurate vital statistics are not available in every case it is obvious that both

infant and maternal morbidity and mortality rates are high for most of the countries in the Region.

At a WHO sponsored seminar on maternal and child health held in Cairo from 25 November to 7 December 42 health workers from 12 countries in the Eastern Mediterranean Region and 3 from neighbouring countries in the European Region met to discuss major problems of maternal and child health. A number of international specialists in various aspects of maternal and child health were available for consultations and to lead the discussions which were centred around the theme: Priorities in the planning and development of maternal and child health services.

The topics discussed under this general heading included methods of assessing the needs of mothers and children and of evaluating maternal and child health services; the administration of these services; the health education of the family (with practical demonstrations on the use of visual aids in health education); the integration of maternal and child health services in the general health services; and staffing and training.

#### Public Health Conference and study tour

A Public Health Conference combined with a study tour of Japan and Taiwan was held by the WHO Regional Office for the Western Pacific from 13 to 30 September immediately following the eighth session of the Regional Committee for the Western Pacific in Hong Kong. The participants included senior health officers from various Member States and territories in the Region, representatives of the Regional Office and a representative of the United States International Co-operation Administration mission in Taipei.

The group assembled in Hong Kong prior to leaving for Japan and Taiwan where they visited research laboratories, medical schools, institutes of public health, nursing education projects, vital and health statistical services, environmental sanitation schemes, hospitals and health centres, maternal and child health services, crippled children's services and

programmes for the control of communicable diseases such as malaria tuberculosis leprosy venereal diseases and trachoma. The subject of the Public Health Conference of which seven sessions were held was "Comprehensive health planning".

### Nutrition training course in Uganda

Malnutrition and varying degrees of sub-nutrition represent an important health problem in African countries south of the Sahara and there is an urgent need for trained personnel to deal with the situation.

A nutrition training course for doctors veterinarians agronomists educators and administrators from the English speaking countries in the African Region was held in Kampala Uganda from 21 October to 23 November. Two similar courses had previously been given at Marseilles for health workers from the French speaking countries of Africa.

The course was organized by the Government of Uganda with joint assistance from WHO and FAO. It included lectures demonstrations field excursions and discussions covering such aspects of nutrition as the assessment of the state of nutrition of individuals in communities and countries the production processing storage and transport of food and the adoption of new techniques with special reference to problems arising from changing economic and social values.

A one week seminar followed during which the practical application of the measures and techniques taught at the training course was discussed from the administrative point of view.

### World medical periodicals

By agreement with WHO and UNESCO which were jointly responsible for the publica-

tion of the first edition of *World Medical Periodicals* in 1953 a second edition of this list of medical and biological periodicals accompanied by their abbreviated titles has just been published by the World Medical Association.<sup>1</sup>

Changes in the new edition include the addition of some 1400 titles and the omission of 600 the addition of publishers names and addresses and the grouping of entries in the subject index by countries. Particulars are given of about 4750 journals of medicine pharmacy dentistry and veterinary medicine in existence at the beginning of 1957 and well known journals which have ceased publication since 1900 but to which frequent reference is made in current bibliographies. The preface headings and explanatory text appear in English French Spanish and German.

Each entry gives the title of the periodical the name and address of the publisher the language of the periodical where this is not apparent frequency of publication and the title abbreviated according to the rules of the *World List of Scientific Periodicals* as modified by the International Code for the Abbreviation of Titles of Periodicals 1954 (International Standards Organization R 4). Changes of title and incorporation with other journals are indicated. Titles are given in the original form translations have been added to Japanese titles and transliterations to Cyrillic and Greek titles.

Two new appendices give (1) a list of the principal international abstracting journals, and (2) a list of the principal international periodical indexes. An additional feature is the inclusion of the International Code for the Abbreviation of Titles of Periodicals 1954.

*World Medical Association (1957) World medical periodicals. New York 349 + xxi pages. Price 30 \$6.00 net in creased copies 40 or \$10.00 net.*

## People and Places

### Malaria field appointments

The eradication of malaria continues to be one of WHO's most pressing aims and several appoint-

ments to WHO-assisted malaria eradication or control programmes were recently announced.

Professor George Macdonald, Director of the Ross Institute of Tropical Hygiene London, has been appointed consultant to the WHO advisory team for malaria eradication now working in the

Philippines Professor Macdonald has reviewed the findings of the advisory team and will assist in the preparation of its final report and recommendations.

Dr H G S Morin has just completed a WHO assignment in Israel where he examined the progress of malaria control and helped in studies for the ultimate eradication of the disease. Dr Morin had previously served WHO as a regional malaria adviser in both the South East Asia and Eastern Mediterranean Regions.

The Government of Egypt which has been carrying out a nation wide malaria control programme affecting more than 4 million people has now decided to aim at the eradication of the disease. WHO has sent Professor Augusto Corradetti of the Istituto Superiore di Sanità Rome to Egypt to assist the Ministry of Health in the preliminary planning of the eradication programme. During the past two years Professor Corradetti has paid several visits to Turkey on behalf of WHO to help develop a similar programme in that country.

Dr R C Muirhead Thomson has been appointed entomologist to a WHO team investigating the progress of malaria control in Southern Rhodesia. Dr Muirhead Thomson has worked on the entomology of malaria and other tropical diseases in various parts of the world including Assam West Africa and the West Indies.

The Government of Uganda is anxious to control malaria in the Kigezi resettlement district and Dr H de Rook has been assigned by WHO to carry out a preliminary survey in this area. Dr de Rook has worked on malaria in West New Guinea for many years.

After two years work with the WHO malaria project in North Borneo Dr W J Stoker is now the leader of a team in Zanzibar. Prior to his service with WHO Dr Stoker was engaged for 25 years in malaria work in Indonesia. Assisting Dr Stoker as entomologist on the Zanzibar team is Dr Ravi Iyengar who has carried out post graduate work at the Harvard School of Public Health.

The antimalaria campaign in which Dr Stoker and Dr Iyengar are engaged is of particular interest. It covers the islands of Zanzibar and Pemba and it is hoped that it will throw new light on possibilities of malaria eradication under tropical African conditions.

#### Cancer survey in Lebanon

The Lebanese Government has asked WHO to undertake a preliminary survey of cancer morbidity and mortality in Lebanon and to advise it on a cancer control plan with particular reference to diagnosis and treatment.

Dr P F Denoit of France will take up this assignment in November. Dr Denoit is the Assistant Secretary General of the International Union against Cancer and Director of the Gustave Roussy Cancer Institute Villejuif France. A member of the WHO Expert Advisory Panel on Health Statistics, Dr Denoit has also served on the WHO Sub Committee on Registration of Cases of Cancer.

#### New psychiatric hospital for Karachi

Dr J B S Lewis of the United Kingdom has been sent to Pakistan by WHO to advise on the design and administration of a new psychiatric hospital to be built in Karachi.

Dr Lewis has administrative experience of psychiatric hospitals of all types and as Consultant Physician to the British National Health Service has given lectures on administration and law in psychiatry.

#### Research on tuberculosis chemotherapy

Research on the effect of chemotherapy on tuberculosis patients in hospitals and at home is being conducted in Madras India under the auspices of WHO in co-operation with the Medical Research Council of Great Britain and the Indian Government. This project is particularly important since its conclusions may be embodied in future technical recommendations by WHO for national tuberculosis programmes.

Dr Ian Sutherland of the United Kingdom went to New Delhi in October to advise on this project. A graduate of Cambridge University Dr Sutherland is a member of the Statistical Research Unit of the Medical Research Council of Great Britain.

#### Reorganization of school health services in Egypt

The rapid expansion of Egypt's educational system has necessitated a reorganization of the country's school health services with a view to their integration into the public health services.

Dr E A Johannning, Deputy Director of the Division of Health and Epidemiology of the Health Services of Norway has been sent by WHO to advise the Egyptian Ministry of Education on this matter for a period of three months starting 1 November.

#### New Public Health Adviser for Eastern Mediterranean Region

Dr Alfred C. Eberwein has been appointed Public Health Adviser and acting Education and Training

Officer at the WHO Regional Office for the Eastern Mediterranean. Formerly Public Health Adviser in the WHO Regional Office for Europe. Dr Eberwein has also served as Medical Officer at the Federal Department of Public Health in Bonn.

#### New appointments at Regional Office for Europe

Dr L. Latauade has been appointed Public Health Administrator at the WHO Regional Office for Europe with the task of co-ordinating all Technical Assistance programmes undertaken in the Region. After graduating from the Medical Faculty of Algiers, Dr Latauade carried out further studies at the Harvard School of Public Health and was from 1950 to 1957 Director of the Public Health Centre at Soissons, France.

Dr D. O. Hasenbring took up his duties as Regional Officer for Social Health and Medical Care at the Regional Office for Europe in November. A graduate of the University of Bonn, he has had wide experience of public health administration both in Germany and the United States of America.

#### Visiting consultant for Gambia

Sir Goddard Cochrane of the United Kingdom is visiting Gambia, West Africa, on behalf of WHO to advise on future animal research in the territory.

An Adviser on Malaria to the Ministry of Health (England and Wales) and a former Director of the Malaria Institute of India, Sir Goddard Cochrane has attended the meetings of all WHO Expert Committees on Malaria convened since 1948 and has served WHO as a consultant on several occasions.

#### Consultant on hospital physics for India

In India as elsewhere there is considerable interest in the problem of radiation protection during diagnostic and therapeutic applications of X-rays and radium therapy. In the past it was thought that there was a threshold below which radiation produced no effect on the body; in recent years, however, there has been increasing evidence that in the case of certain radiation effects—for instance, the production of gene mutations—there is no threshold below which harmful consequences are completely absent. Many countries are therefore seeking ways of eliminating exposure to radiation in excess of that necessary for the success of any particular diagnostic or therapeutic procedure.

Mr R. F. Farr of the United Kingdom is touring India under WHO auspices from 20 November to 31 December to give lectures at various radiological centres on the British approach to this problem, and to advise on hospital physics in general. Mr Farr is deputy chief hospital physicist at the Christie Hospital and Holt Radium Institute, Manchester, and a Committee Member of the Hospital Physicists Association of Great Britain.

#### Occupational health survey in Lebanon

Dr Arne Bruusgaard, Chief of Factory Inspection at the Ministry of Labour, Oslo, has been asked by WHO to assist in a survey of occupational health needs and resources now being carried out in Lebanon.

Dr Bruusgaard acted as WHO consultant for a similar survey in Egypt in 1952, one result of which was the recent establishment of an Institute of Occupational Health in Alexandria.



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